



FRIDAY, JULY 15, 1898.

CONTENTS

ILLUSTRATIONS:	PAGE	GENERAL NEWS:	PAGE
Eight-Wheel Passenger Locomotives—Cleveland, Cincinnati, Chicago & St. Louis Railway.....	505	Bridge Building.....	520
Railroads in Vicinity of Santiago de Cuba.....	509	Meetings and Announcements.....	520
Interlocking at Concord, N. H.....	510	Personal.....	521
The Johnson Door for Hopper Bottom Cars.....	511	Elections and Appointments.....	521
A New Locomotive Feed Water Strainer.....	512	Railroad Construction.....	522
Ware's Tie-Plate Surfer.....	513	Electric Railroad Construction.....	522
Track Sanding Arrangement.....	513	General Railroad News.....	523
		Electric Railroad News.....	524
		Traffic.....	524
CONTRIBUTIONS:		MISCELLANEOUS:	
G. P. A. and the Public.....	505	Technical.....	517
Highwayman Again.....	505	The Scrap Heap.....	518
Side Throw of Track Under Extreme Heat.....	505	Railroads Under Construction or Projected.....	506
		Specifications.....	508
EDITORIALS:		Center Bearings or Side Bearings.....	509
Heat Tests for Car Wheels.....	514	The Apprentice Boy.....	510
A Point in Corporation Law—The Kinderhook & Hudson Case.....	514	Car Cleaning.....	511
Electric and Other Bell Cords in England.....	515	New Designs for Electric Mining Locomotives.....	512
		Classification of Thesis Work in Electrical Engineering.....	512
EDITORIAL NOTES.....	54, 515	The Present Status of Electrical Engineering.....	512
		Freight Carting in London and New York.....	513
New Publications.....	515	Railroad Legislation in Massachusetts.....	516
Trade Catalogues.....	516	Steel Permanent Way.....	516
		Waterloo & City Railway.....	517
GENERAL NEWS:		Treatment of Timber After Felling.....	517
Locomotive Building.....	519	Foreign Railroad Notes.....	517
Car Building.....	521		

Contributions.

The G. P. A. and the Public.

Chicago, July 8, 1898.

To the Editor of the Railroad Gazette:

During my absence abroad I have been much impressed by a radical difference between the modes generally adopted there by the railroad companies to reach the public by advertisements, and those followed by the companies in the United States. There, by maps, time-tables, notices, etc., of each company, displayed in its own stations and upon its own premises in the most conspicuous manner, what we may call its own public is informed in the amplest manner of the facilities which the line affords, and how many places can be reached by its several branches, the connections which can be made being carefully explained to the comprehension of the wayfarer. Here, on the contrary, the last place to look for information about the A., B. & C. R. R. would be in its own stations; its maps, placards, etc., are only to be found in the stations of distant connections, the further removed the more likely they will have been visited by the gentlemen of the tack-hammer.

Instead of spending their efforts in giving information to the passengers sitting in his own stations, and who really want to know something about his road, the American passenger agent seems to me to have his mind fixed upon competition in distant fields, and to aim only at securing the occasional traveler who may be going here and there.

Now, since the great consolidations have been effected only an expert can remember the various branches, even of the road upon which he happens to be a commuter, and unless he has more than ordinary curiosity he will not take much pains to inform himself, but will be quite likely to make use of knowledge already possessed, and go to an unusual destination by another route, although his home road affords a better one for him. Such occurrences are certainly frequent among my acquaintances here, and I write this letter to suggest the inquiry whether there is any place where the passenger agent will be more likely to encounter persons who will feel a real interest in facts concerning his road and branches and connections than in his stations, and on the premises of his company? They visit those premises every day or so; they often wait listlessly in the stations, and are in a mood to absorb information; they would study a good map with something like real satisfaction. I remember an instance when a correct map of a certain road and its connections was published by the company it was asked for to be hung up in many of the high schools and other public places, and became a more valuable advertisement than had been anticipated.

Since my return I have had occasion to travel considerably, and have experienced already serious inconvenience from the difficulty of getting information which either maps or time tables might convey. I was lately upon a line where I had received a folder supposed to inform the public, yet three of the branches operated by the road, and one of which I wished to go over, were not referred to in the folder. The lately appointed station agent did not know that his road operated such a branch. These seem to me to be significant instances of failure to reach the right party by easy means, because they had been neglected; yet the enterprising and gentlemanly pas-

senger agent spends large sums in addressing a public which is entirely indifferent to his advertising, because it does not meet its momentary need. I will add a word of wisdom from an ancient sage—that it is when a fish is hungry he is most likely to take the bait.

ARCHIMEDES STEPHENSON WATT.

The Highwayman Again.

Cincinnati, July 1, 1898.

To the Editor of the Railroad Gazette:

My attention has just been called to a recent performance that shows that our profession is not entirely free from scamps. The circumstances are these: In a town not a great way from our city a new draw-bridge was needed for a country highway. Some engineers took the county officers for a trip to several other cities to show them some bridges which they had built. It is needless to say that this trip did not cost the county officers anything. These engineers then volunteered to get up plans on which the county officers could get bids. These plans were nicely got up and tenders asked for. There was one honest bridge concern that made a straight bid on the bridge and foundations, of \$55,000. Several other bridge concerns bid from \$35,000 to \$40,000. There evidently was collusion between these other bridge companies and subsequent developments proved that the plans and specifications were "loaded."

The transaction was watched by the honest bridge company's man and by several engineers, who suspected what was going on. Three separate and distinct sketches were made from the engineers' plans. A few weeks after tenders were asked for an investigation developed the fact that the original plans had been stolen and other plans substituted. These new plans were apparently substituted by consent of the town board, or, at any rate, it had that appearance. When the tenders were made a certified check for \$3,000 was required. This check was deposited with the town board by the company making the lowest bid.

A few days afterward a member of this company called on the town board with another check, stating that the first one had not been properly signed; it had been signed by one member of the firm and should have been signed by the firm name. The second check was given in the place of the first, which was taken away. The investigation developed the fact that the second check was not certified to by the bank, but was stamped "certified" and "correct," and was signed by the firm name. Of course, no funds were found in bank when an effort was made to collect this check. The lowest bidders were, of course, the firm of engineers who had made the plans.

Another scheme these rascals play on the town boards is to ask for "lump sum" bids. Such bids should always be looked upon with suspicion. It sounds well to a town board to say that they are not going to be stuck with any bill for extras, but the specifications and plans are so drawn that no honest bidder dare bid on them. The catch in such specifications may generally be looked for in the clauses giving large discretion to the engineer to call for certain things or not call for them, as he pleases. The rascals know he will not call for these things, as he is their man. The honest bidder must figure that he will call for them and so is left on price.

Another favorite device of the rascally bridge building engineers is to specify some article on which there is a patent. They know they can use the patent at a nominal figure. Honest bidders who write the patentee for prices are quoted high figures.

This matter of highway bridges should receive attention by the profession and that, too, at once. It has reached such a pass here that many honest bridge concerns will not bid on highway bridges at all.

Laws should be passed putting township bridges under charge of the Railroad Commissioner, same as railroad bridges now are. I hope you will stir up this matter for the benefit of the younger members of the profession.

ENGINEER.

Side Throw of Track Under Extreme Heat.

New York, July 9.

To the Editor of the Railroad Gazette:

I notice in your last issue (page 499) mention of track thrown out of line by expansion on a very hot day.

I do not care to go into detailed accounts of particular instances, but will try to convey to your mind the impressions that have been made on my own by experience.

The cases of lateral buckling on our road during the last five years have run higher than before, and the fact that it has appeared only in late years I can account for on no other ground than that our men have, of late, been required to go more into the refinements, and put their track up to a higher degree of perfection than was expected in years previous. The click, rattle and batter at joints, while not so serious as formerly, are still more or less in evidence, and is always being noticed and criticised by the superior officers. All agree that the wide spacing of the rails is in a measure responsible for the punish-

ment at the joints, and, on several occasions, in spite of the protest of some of us, our supervisors and foremen have been instructed to reduce these interspaces to a minimum, or, in other words, down to that actually required by the changes in temperature. Theoretically, this seems all right, but there are at least two distinct elements that come in to defeat so nice an adjustment.

First, under a heavy traffic and heavy loads, the cold rolling that takes place on the top of the rail throws more or less metal down over the ends and into the openings, thus making the interspaces just so much less.

Second, in spite of the resistance furnished by the spike slots and other devices that we have used to anchor the track at all points, the rails do creep more or less, especially on grades, and when they bunch in long stretches the expansion tends to throw the track locally out of line, unless it is very firmly held by the ballast; that is, with sufficient firmness to force the movement longitudinally. When this very great pressure comes on, I feel satisfied that, in many cases, the track is actually eased off its bearing on the roadbed, and bowed or buckled upward. In this position, if for renewal of ties or any other purpose, some of the ballast has been removed, it only requires the jar of a passing train to change the upward buckling into a lateral one, and we had one instance in which the engine and all the cars of the train but one passed over, riding smoothly, and the track sprung 15 in. out of line just in advance of the last car.

It may, therefore, be said briefly that, if the interspaces are reduced down sharply to just what is required for changes in temperature, the lips that are formed on the ends of the rails, and the bunching incident to creeping, will make it very difficult to hold the track in line at high temperatures, and wherever there is a local weakness the severe vibration under the train will throw the whole structure sideways.

Of course, all rails, when laid, have openings corresponding to the possible expansion and contraction, but in service they keep creeping together and apart, so that our men are obliged frequently to take hold and move quite long stretches back and forth to their proper position. This is a tedious operation, but we have not yet been able to anchor the individual rails with sufficient firmness to avoid it.

P. A. E.

To the Editor of the Railroad Gazette:

I would not care to say that we have had any case of late, but it is an old fact, and one well known to all maintenance of way engineers who have had even a short experience in track work, that if the rails are laid too tight the expansion will throw the alignment on straight lines into kinks, which will show very plainly to the eye. On a curve it often happens that the expansion is taken care of by the curve moving out, and is not so perceptible in the alignment as on a straight line. It is also a fact that rails may be laid with a proper opening at the joints and the splices, with the ordinary strong bolts (six to a joint) that are used, if screwed up too tight, the rail will not shove through the splice to accommodate the expansion. This forms practically a continuous rail, which may be a mile or two long, and the condition is even worse than laying it a little too tight, because no accommodation for the expansion takes place, and the track is thrown out of line in the worst manner.

CHIEF ENGINEER.

Eight-Wheel Passenger Locomotives—Cleveland, Cincinnati, Chicago & St. Louis Railway.

The Cleveland, Cincinnati, Chicago & St. Louis Railway is now having four eight-wheel passenger locomotives built at the Schenectady Locomotive Works, which will be used to haul the "Knickerbocker Special" trains between St. Louis and Cleveland. These trains usually consist of three sleeping cars, a buffet car and one or two day coaches, making the average weight of the train, exclusive of the engine and tender, between 250 and 300 tons. The average schedule time between the points named is very near 40 miles an hour, without deducting time in stopping for water and at crossings, and the regular station stops.

The engines were designed by Mr. William Garstang, Superintendent of Motive Power, and the general features are shown by the accompanying engraving. The total weight in working order is 126,000 lbs., the weight on the driving wheels is 83,000 lbs., and the tender loaded weighs 98,000 lbs. The cylinders are 20 in. in diameter by 26 in. stroke, and the driving wheels are 78 in. in diameter.

The boiler is of the extended wagon top type, designed to carry a working steam pressure of 200 lbs. per sq. in. One continuous $\frac{3}{8}$ -in. steel plate forms the sides and top of the boiler shell at the rear, and the horizontal joints of the barrel are quadruple riveted without welt strips. The firebox is wholly above the frames, and has the crown sheet stayed with 1-in. radial stays. The outside ends of all staybolts are drilled with a $\frac{3}{8}$ -in. hole, $1\frac{1}{4}$ in. deep. Twenty-nine cleaning holes are provided, one on

each side of the first ring at the top, two central holes, one in the bottom of the first and one in the third ring; eleven in the back head near the crown level, two on each side of the firebox, three on each side of the boiler at the crown level, and one on each corner of the firebox above the mud ring.

There are in each boiler 320 charcoal iron tubes 2 in. in outside diameter, with copper ferrules on both ends. The heating surface of the tubes is 1,991 sq. ft., that of the firebox 167 sq. ft., making a total heating surface of 2,158 sq. ft.; the grate area is 30.8 sq. ft. The specifications require that the boilers must withstand a hydraulic test of 225 lbs. per sq. in., and when fired up in the usual manner must withstand a steam pressure of 200 lbs. per sq. in. without showing leakage or distortion. Magnesia sectional boiler lagging is used, containing about 80 per cent. of magnesia, which in turn is covered with planished iron. The cylinders and the space under the cylinders and between the frames are similarly lagged and covered with sheet iron. The front truck wheels are of the steel tired spoke pattern, 36 in. in diameter.

The tender has a capacity for 5,000 gals. of water and 9 tons of coal, and is fitted with Fox pressed steel trucks. The under-frame is of steel construction.

Cast steel is used for the following parts: Driving wheel centers, steam chests, steam chest covers, pistons, crossheads, cylinder heads, foot plates, driving boxes, auxiliary dome and boiler expansion pad. The driving axles, front truck and tender axles, crank

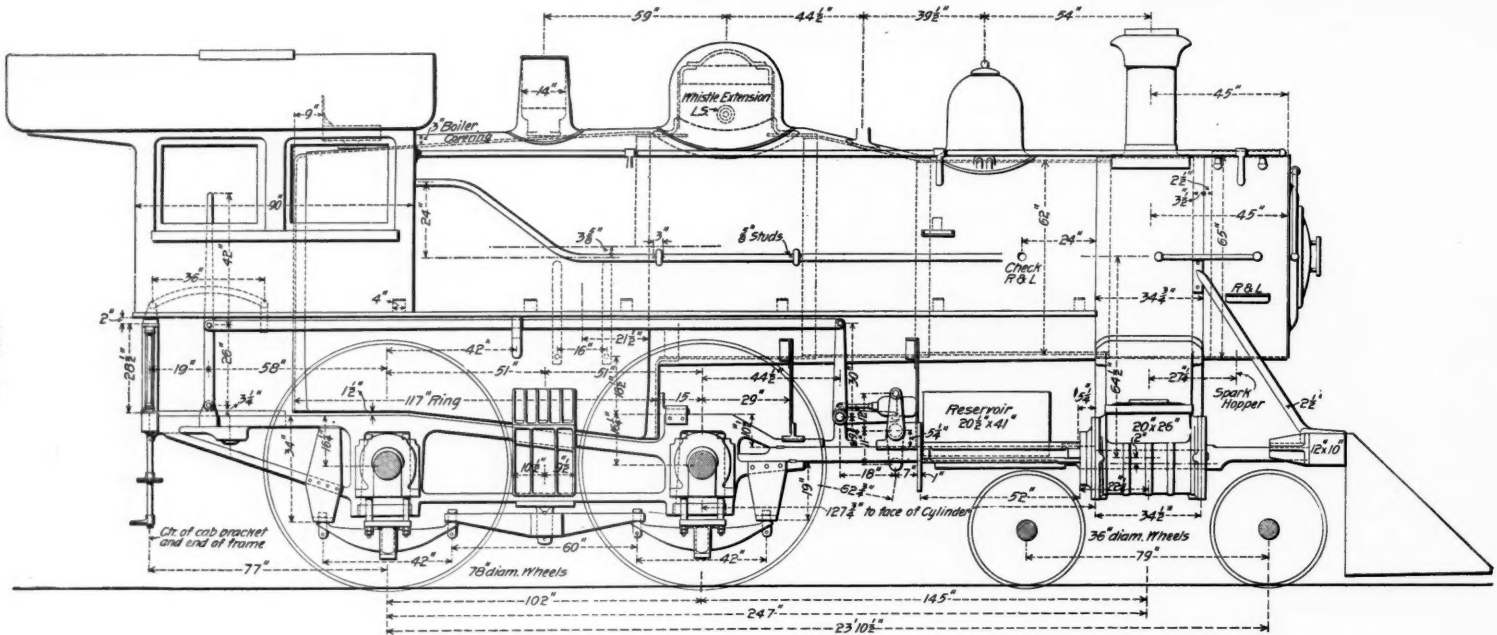
Crown sheet stayed with 1 in. diam. radial stays.
Dome, diameter 30 in.
Firebox, length 9 ft. 5 in.
" width 3 ft. 5 in.
" depth, back 61 3/4 in.
" material Carbon steel.
" thickness of sheets 3/8 in.
" water space, width; Front 4 in.; Sides 3 1/2 in.; Back 4 in.
Grate Rocking—Company's Standard.
Tubes, number 320
" material Charcoal iron.
" capacity, diameter, No. 11 gage 12 in.
" length over sheets 12 ft.
Smokebox, diameter 65 in.
" length 62 1/2 in.
Exhaust nozzle, single Permanent.
" diameter 5 1/2 in.
Netting, wire or plate Both.
" size of mesh or perforation 2 1/2 x 2 1/2 in.
Stack Straight.
" diameter 16 in.
" height above smokebox 3 ft. 5 in.
Tender.

Type Swivel trucks.
Tank capacity for water 5,000 gals.
Coal capacity 9 tons.
Material in tank Steel.
Thickness of tank sheets 1/4 in.
Under-frame Steel.
Truck Fox pressed steel.
Truck with Swinging motion.
Type of truck spring Helical.
Diameter of truck wheels 36 in.
Diameter and length of axle journals 5 x 9 in.
Distance between centers of journals 6 ft. 4 in.
Diameter of wheel fit on axle 6 1/2 in.
Diameter of center of axle 5 1/2 in.
Length of tender frame over bumpers 22 ft. 3 in.
Length of tank 19 ft. 6 1/2 in.
Width of tank 9 ft. 3 1/2 in.
Height of tank, not including collar 4 ft. 7 in.
Height of tank over collar 1 ft. 2 in.
Type of back drawhead Janney.
Without water scoop.

tion. It is fairly certain, however, that a very large proportion of the roads to be built within the next few months will be by some of the companies here named.

United States.

Aberdeen & Asheboro.—Extension of the Troy branch south 14 miles from Troy, N. C., to Mt. Gilead. Grading nearly completed. Gibson & Carpenter, contractors. J. R. Page, Aberdeen, N. C., General Superintendent.
Alabama & Tombigbee.—Lower Peach Tree, Ala., east 37 miles to Coffeeville. Four miles graded. George R. Hannon, Fulton, Ala., General Manager.
Albany, Lebanon, Sodaville & Waterloo.—Albany, Ore., southwest 21 miles to Waterloo, building. M. W. Wilkins, Waterloo, President.
Arizona & Southeastern.—Deer Point, Ariz., south four miles to the Mexican boundary line. Work in progress.
Arkansas & Choctaw.—Extension west from the Texas State line, 20 miles into Indian Territory. W. H. Carson, Texarkana, Tex., Superintendent.
Arkansas & Oklahoma.—Extension of the old Bentonville line from Bentonville, Ark., west 17 miles to Gravett on the Kansas City, Pittsburgh & Gulf. Grading in progress. J. M. Bayless, Bentonville, contractor.
Arkansas Central.—Fort Smith, Ark., east 44 1/2 miles to Paris. Track laid two miles beyond Charleston 23 1/2 miles. Work being done by the company. Proposed extension from Paris to Little Rock and Hot Springs, about 170 miles. N. B. Kendall, Fort Smith, Ark., General Manager.
Arkansas, Louisiana & Southern (successor to the Minden).—Minden, La., northwest 20 miles to connect with the Louisiana & Arkansas, which is being extended south from Stamps, Ark. Grading in progress.
Ashland & Wooster.—Jewett, O., through Stark County to Ashland, 52 miles. H. B. Camp, Akron, O., President.
Atchison, Topeka & Santa Fe.—Extension of the Little River Branch from a point near Holyrood, Kan., west 13 1/2 miles to Bardeen. Grading in progress.
Atlanta & Alabama.—Proposed line from Atlanta, Ga., southwest about 180 miles to Selma, Ala. The Erie Construction Company, of New York, contractors. R. M. Mitchell, Augusta, Ga., President.
Bangor & Portland.—Branch from Pen Argyl, Pa., to the American Bangor Quarry, 1 1/2 miles.



Passenger Locomotive for the Cleveland, Cincinnati, Chicago & St. Louis Railway.

MR. WILLIAM GARSTANG, Superintendent Motive Power.

Built by the SCHENECTADY LOCOMOTIVE WORKS, Schenectady, N. Y.

pins, piston rods and connecting and parallel rods are forged steel. Pressed steel is used for the boiler front and door, smoke stack base, and the casings for the steam dome, sandbox and cylinders.

The following is a list of the principal dimensions and the names of the makers of the special equipment:

Eight-Wheel Engines—C., C. & St. L. Ry.

Fuel—Bituminous Coal.

Gage	4 ft. 8 1/2 in.
Weight on drivers	83,000 lbs.
" truck wheels	43,000 lbs.
" total	126,000 lbs.
" tender loaded	98,000 lbs.
Wheel base, total, of engine	23 ft. 11 in.
" driving	8 ft. 6 in.
" total (engine and tender)	49 ft. 5 in.
Length over all, engine	37 ft. 3 in.
" total, engine and tender	59 ft. 6 in.
Height, center of boiler above rails	8 ft. 9 in.
" of stack, above rails	14 ft. 10 in.
Heating surface, firebox	167 sq. ft.
" tubes	1,991 sq. ft.
" total	2,158 sq. ft.
Grate area	30.8 sq. ft.
Drivers, diameter	36 in.
" centers	cast steel.
Truck wheels, diameter	36 in.
Journals, driving axle, size	5 1/4 x 11 1/2 in.
" truck axle, size	6 x 11 in.
Main crank pin, size	5 1/2 x 6 1/2 in.
Cylinders, diameter	20 in.
Piston, stroke	26 in.
" rod, diameter	3 1/2 in.
" packing	Metallic.
Main rod, length center to center	7 ft. 11 1/4 in.
Steam port, length	20 in.
" width	1 1/2 in.
Exhaust ports, length	20 in.
" width	2 1/2 in.
Bridge, width	14 in.
Valves	Richardson balanced.
" greatest travel	6 in.
" outside lap	1 in.
" inside lap	0 in.
" lead in full gear	1/8 in.
Boiler	Extended wagon top.
" working steam pressure	200 lbs.
" material in barrel	Carbon steel.
" thickness of material in barrel	5/8 in.
" diameter of barrel	62 in.
Seam, horizontal	Quadruple riveted without welt.
" circumferential	Double riveted.
Side and back sheets	3/8 in.
Thickness of tube sheets	1/2 in.
" crown sheet	3/8 in.

Makers of Special Equipment.

Tires Latrobe Steel Co.
Sight-feed lubricators Nathan Mfg. Co.
Front and back couplers McConway & Torley Co.
Safety valve, one 3/4-in. Kunkle and one 3/4-in. Coale.
Steam heat equipment Gold Car Heating Co.
Reducing valves Gold Car Heating Co.
Sanding devices H. L. Leach.
Injector, No. 10 Monitor Nathan Mfg. Co.
Driver brake American Brake Co.
Tender brake Westinghouse Air Brake Co.
Tender brake beam Chicago Railway Equipment Co.
Driver brake shoes Chicago Railway Equipment Co.
Air pump Westinghouse, 9/4 in.
Steam gages Ashcroft Mfg. Co.
Engine truck springs A. French Spring Co.
Driving springs A. French Spring Co.
Tender springs A. French Spring Co.
Piston rod packings C. C. Jerome.
Valve rod packings C. C. Jerome.
Stay bolts Ewald Iron Co.
Boiler and firebox plates Carbon Steel Co.
Rivets Burden Iron Co.
Bearing metal U. S. Bronze Co.

Railroads Under Construction or Projected.

Following the list of last February, we give below a list of railroads on this continent which are either now building or upon which there is some likelihood that work may be begun in the near future. The list includes 234 roads in the United States, 23 in Canada and 18 in Mexico. Undoubtedly some have been omitted which should find a place in this compilation, but were every enterprise included which has been proposed during the past few months it would be easy to extend the number two and perhaps three fold. Even many of those included will probably come to nothing, and perhaps with a fuller knowledge of the conditions should be excluded from the list.

No attempt has been made to summarize the mileage here proposed or actually under construction, since to do so would not only be useless, but actually misleading. The larger the project, as a rule, the less likely is it of fulfillment. That the number of roads named is larger by 50 per cent. than that of last February may or may not indicate a corresponding improvement in the outlook for railroad building. The compiler may have been less exacting in the standard here adopted than for the previous compila-

tion. Bayfield Harbor & Great Western.—Bayfield, Wis., through Roys Point, about 40 miles. Track laid to Raspberry, 10 miles. E. C. Hollidge, Bayfield, Wis., Chief Engineer.

Bayfield Transfer Ry.—Bayfield, Wis., along the harbor frontage. About eight miles under contract, of which 4.3 miles has been completed. E. C. Hollidge, Bayfield, Wis., Chief Engineer.

Beaumont Wharf & Terminal.—Belt line of 8.5 miles around the city of Beaumont, Tex. About three miles completed. W. W. Willson, Beaumont, Tex., Vice-President.

Bellingham Bay & Eastern.—Extension from Blue Canyon, Wash., to timber, 10 miles. J. J. Donovan, New Whatcom, Wash., Vice-President.

Boise, Nampa & Owyhee.—Guffey, Idaho, south 25 miles to Silver City. J. M. Clark, Nampa, Idaho, Chief Engineer.

Boyer City & Southeastern.—Boyer City, Mich., to East Jordan, seven miles. W. H. White, Boyer City, President.

Brainerd & Northern Minnesota.—Terminus at Walker, Minn., northeast about 30 miles to a point on the Great Northern. A. Guthrie & Co., St. Paul, Minn., contractors.

Breckenridge, Dillon & Northern.—Breckenridge, Colo., north 25 miles via Dillon and Steamboat Springs to the Ute Indian Reservation. Grading completed to Dillon, 75 miles. J. P. Rooney, Breckenridge, President.

Buffalo, Rochester & Pittsburgh.—Allegheny & Western extension from Punxsatowney, Pa., west 95 miles to New Castle. Section to Greigsville 45 miles, building. Curwensville Construction & Investment Co., Curwensville, Pa., C. J. Ryan, New York City, and Thomas Collins & Co., Bellefonte, Pa., contractors. Surveys in progress from Greigsville to New Castle, 50 miles.

Cairo, Hopkinsville & Cumberland Gap.—Projected from Cairo, Ill., to Cumberland Gap, Ky., about 300 miles. B. A. Neale, Mayfield, Ky., President.

Calumet Western.—Belt Line within the city limits of Chicago connecting two branches of the Pennsylvania Co., the Michigan Central and the Chicago, Rock Island & Pacific. Right of way bought. To be built by the three companies.

Cammal & Black Forest.—Extension of three miles in Pennsylvania, to be built this year.

Cane Belt—Eagle Lake, Tex., on the Southern Pacific, south 15 miles to Bonus. Rails laid from Lakeside to Matthews. W. T. Eldridge, Eagle Lake, Vice-President and General Manager.

Catskill & Tannersville.—Extension to Haines Corners, N. Y., 4 1/4 miles. Otis Construction Co., contractors. Charles R. Richardson, 54 Harrison street, New York, President.

Center & Tenaha.—Center, Tex., north 11 miles to Tenaha. Grading in progress. Proposed extension of some 22 miles further. S. T. Fleshman, Center, Tex., Superintendent.

Charleston, Clendennin & Sutton.—Extension from Clay Court-House, W. Va., northeast 50 miles to Sutton. Chattahoochee Valley.—River View, Ga., southwest

toward Columbus, Mott or Opelika. Surveys in progress. L. Lanier, West Point, Ga., President.

Chattanooga Southern.—Extension from Gadsden, Ala., south 15 miles to Montgomery. W. S. Hoskins, Chattanooga, Tenn., General Manager.

Cheat Valley.—Projected from Point Marion, Pa., southeast 23 miles up Cheat River to Carson's, W. Va. Completed from Rowlesburg, W. Va., to Whetsell, eight miles. J. J. Storer, 514 Gerard Building, Philadelphia, Pa., President.

Chesapeake Beach.—Washington, D. C., east 30 miles to Chesapeake Beach, Md. Track laid for 12 miles from Washington. Chesapeake Bay Construction Co., Washington, D. C., builders. Green & Burrows, Washington, contractors.

Chicago & Northwestern.—Extension of the Belt Line around the city of Manitowish. Contract let.

Chicago & Southeastern.—Extension from Anderson, Ind., east 20 miles to Muncie. Grading in progress.

Chicago, Burlington & Quincy.—Grant City & Southern extension from Grant City, Mo., south about 20 miles to a point two miles west of Albany, connecting another branch.

Chicago Great Western.—Hampton, Ia., southwest 38 miles to Webster City and thence to Sioux City. Surveys in progress.

Chicago, Indiana & Eastern.—Projected from Converse, Ind., southeast 79 miles, to Richmond. Converse to Swayzee, 7 miles, and Matthews to Muncie, 15 miles, under contract. H. E. Drew, Fairmount, Ind., General Manager.

Chicago, Indianapolis & Louisville.—Clear Creek, Ind., to Harrodsburg, nine miles.

Chicago, Rock Island & Pacific.—Extension of the Chicago, Rock Island & Texas line from Bridgeport, Tex., west 29 miles to Jacksboro. Partially completed.

Chicago, St. Louis & Texas Air Line.—Brownsville, Tex., north about 270 miles to San Antonio. Final surveys completed. Dr. G. Griffin Gunn, San Antonio, Tex., President.

Chicago Terminal Transfer.—Franklin Park near Chicago, east 6.75 miles to Mayfair, within the city limits. McArthur Bros., Chicago, contractors.

Chicago, Waukegan & North Shore.—Waukegan, Ill., north 10 miles along the lake to Winthrop Harbor. Winthrop Harbor & Dock Co., Winthrop, Ill.

Chilkoot Railroad & Transportation Co.—Three proposed extensions from Crater Lake to Lindeman, around White Forest Rapids on the left bank of the Yukon, and around Five Finger Rapids. Hugh C. Wallace, Tacoma, Wash., President.

Choctaw, Oklahoma & Gulf.—Fort Reno, Okla., Ter., west 47 miles toward Arapahoe. Track laid to Geary, 17 miles. Extension from Wister, I. T., east seven miles to a point on the Kansas City, Pittsburgh & Gulf, now building. J. H. Maney & Co., contractors.

Cincinnati, Georgetown & Portsmouth.—Georgetown, O., southeast 23 miles to West Union. Surveyed. E. W. White, Cincinnati, Vice-President and General Manager.

Colorado & Northwestern.—Sunset, Col., southwest to Eldora, and west over the summit of the mountain range. J. T. Blair, Boulder, Col., General Manager.

Colorado Valley.—Projected from Sweetwater, Tex., southeast about 250 miles toward San Antonio and Austin. Completed from Sweetwater to Ada, 75 miles. Irving Wheatcroft, Sweetwater, Tex., Vice-President and General Manager.

Columbia Southern.—Wasco, Ore., south 17 miles to Moro. Work in progress. Proposed extension to Prineville, 120 miles. D. C. O'Reilly, Wasco, General Manager.

Columbus, Fulton & Northern.—Columbus, Miss., north about 130 miles to Nashville, Tenn. Newman Cayce, Columbus, Miss., President.

Columbus, Hocking Valley & Athens.—Columbus, O., along the Hocking Valley and Athens Canal to Athens, 70 miles. Work to begin soon.

Coos Bay, Rogue & Eastern.—Myrtle Point, Ore., to Roseburg, 60 miles.

Corvallis & Eastern (successor to the Oregon Central & Eastern).—Extension from Idanha, Ore., east to Snake River, in Malheur County.

Cripple Creek Short Line.—Colorado Springs, Colo., west through Bear Creek Canyon to Cripple Creek, 56 miles. Contract let. H. B. Stone, Colorado Springs, among those interested.

Cumberland Mountain.—Glen Mary, Tenn., southwest about 40 miles to Monterey. Right of way secured. James M. Dobbins, Cincinnati, O., among those interested.

Deckerline, Osceola & Northern.—Wordin, Ark., northeast 84 miles to Paw Paw Junction, Mo. E. M. Ford, Deckerline, Vice-President.

Deepwater.—Robson, W. Va., on the Kanawha & Michigan, west 25 miles up Lower Loop Creek to Glen Jean. Work in progress. The Gauley Mountain Coal Co. of Ansted, W. Va., is building the road.

Delaware Valley, Hudson & Lehigh.—Stroudsburg, Pa., northeast 45 miles up the Delaware River to Matamoras. Hart & McTigue of Brooklyn, N. Y., contractors. Dr. J. V. Lung, 382 Marion St., Brooklyn, President.

Demopolis & Pensacola.—Pensacola, Fla., north via Marengo, Ala., to Demopolis. Work in progress. John C. Webb of Demopolis, Ala., is among the incorporators.

Denton, Denton & Western.—Piano, Tex., west 40 miles via Decatur to Bridgeport and thence to Sweetwater. Ten miles of profile completed. R. E. Carswell, Decatur, Tex., President.

Denver & Rio Grande.—Extension to the Dolly B. and Ithex mines near Leadville, Colo. Under consideration.

Des Arc & Northern.—Higginson, Ark., southeast 19 1/2 miles to Des Arc. E. R. Dalhoff, Magnolia, Kas., contractor. George C. Griffith, Higginson, President.

Detroit & Lima.—Columbus, Northwestern extension from St. Mary's, O., southeast 50 miles to Peoria. All graded. Track laid from St. Johns to Bellefontaine. The Ferguson Construction Co., 69 Wall street, New York City, contractors. J. R. Megrue, 120 Griswold street, Detroit, Vice-President and General Manager.

Duluth & Iron Range.—Waldo, Minn., north 18 miles to Colquet River to replace old road. Practically completed. Waldo to Ore Docks at Two Harbors, five miles.

Duluth & Northern Minnesota.—Duluth, Minn., northeast through St. Louis and Lake Counties into extensive lumber tracts. Alger, Smith & Co., Detroit, Mich., owners. Work in progress.

Duluth, Mississippi River & Northern.—Extension from Hibbing to Davis, 15 miles.

Durham & Charlotte.—Glendon, N. C., southwest toward Charlotte. Frank D. Jones, Glendon, N. C., President.

East Louisiana.—Proposed extension from Covington, La., north about 36 miles to the State Line. John Polite, New Orleans, La., President.

Elm Valley.—McKinney, Tex., west 16 miles to the Denton County line. E. W. Kirkpatrick, McKinney, Tex., President.

El Paso & Northeastern.—El Paso, Tex., northeast 165 miles to White Oaks, N. Mex. Track laid to Alamogordo, N. Mex. Branch from Alamogordo east 25 miles to the Sacramento Mountain. Grading in progress. George S. Good & Co., of Lock Haven, Pa., contractors. Built by the New Mexico Railway & Coal Co., 66 Broadway, New York City.

El Paso Southern.—Incorporated in 1897, to build the terminals at El Paso, Tex., and the bridge across the Rio Grande River for the Rio Grande, Sierra Madre & Pacific. Partially completed. A. Foster Higgins, 54 Exchange Pl., New York City, is President of the R. G., S. M. & P.

Escanaba River.—Escanaba, Mich., northwest about 60 miles to Republic on the Chicago & Northwestern. Grading in progress. Isaac Stephenson, Marinette, Wis., President.

Fallsburg & Monticello.—Fallsburg, N. Y., north six miles to Fallsburg. Surveyed. B. Van Steenberg, 53 Wall Street, New York City, President.

Florida, Alabama & Northern.—Elba, Ala., southwest about 125 miles to Pensacola, Fla. Surveys in progress. W. B. Wright, Pensacola, Fla., President.

Florida Western.—Appalachicola to Carrabelle, Fla., 22 miles. About 10 miles graded. R. L. Bennett, Tallahassee, Fla., President.

Fort White & Southern.—Santa Fe Junction, Fla., to Leboville, 20 miles. Building from Cow Creek Camp to the Suwanee River, three miles. Thomas W. Pitts, Fort White, Fla., President.

Fort Worth & Northwestern.—Ft. Worth, Tex., northwest about 120 miles to Throckmorton. Preliminary surveys made. B. B. Paddock, Mayor of Ft. Worth, President.

Franklin, Somerset & Kennebec.—Farmington, Me., south 50 miles to Augusta. Under contract to Franklin Construction Co., Philadelphia, to New Sharon, 8 1/2 miles. Grading begun. L. Atwood, Farmington, Me., President.

Gallatin.—Three Forks, Mont., on the Northern Pacific, southwest about 100 miles to coal fields. Work to begin this summer on the first 50 miles. W. W. D. Turner, Bozeman, Mont., President.

Galveston, Brazos & Southwestern.—Galveston, Tex., west about 216 miles to San Antonio. Grading completed from Galveston to Angleton, 42 miles. L. E. Beadle, Galveston, Tex., Chief Engineer.

Georgia Pine.—Arlington, Ga., north 23 miles to Dawson, and from Bainbridge south to Tallahassee, Fla. R. B. Coleman, Bainbridge, Ga., General Manager.

Gila Valley, Globe & Northern.—Geronimo, Ariz., northwest 58 miles to Globe. Completed to San Carlos, 25 miles. Midland Construction Co., 313 Stimpson Block, Los Angeles, Cal., contractors. William Garland, Los Angeles, Cal., President.

Glade Creek & Raleigh.—Extension from Hinton, W. Va., west five miles up Piney Creek. J. L. Lancaster, Croft, W. Va., Chief Engineer.

Great Northern.—Extension of the Fosston Branch from Fosston, Minn., east 220 miles to Duluth. A. Guthrie & Co., of St. Paul, Minn., hold part of the contract. Grading about completed.

Guadalupe Valley.—Victoria, Tex., east about 120 miles via Alvin to Galveston. Victoria, north about 90 miles to Smithville, Tex. Guadalupe Construction Co., Victoria, Tex., contractors. Uriah Lott, Victoria, President and General Manager.

Gulf & Brazos Valley.—Henrietta, Tex., south 400 miles through Mineral Wells to Velasco. Under contract to A. D. Emerson & Co., Lacota, Tex., from Peck City to Henrietta. W. A. Squires, Henrietta, Tex., President.

Gulf & Interstate.—From Beaumont, Tex., northeast through Alexandria, La., to Vidalia, La., on the Mississippi opposite Natchez. L. P. Featherstone, Galveston, Tex., General Manager.

Gulf, Beaumont & Great Northern (successor to the Gulf, Beaumont & Kansas City).—Extension from Beaumont, Tex., north via Jasper and San Augustine to Paris. John H. Kirby, Houston, Tex., President.

Gulf, Colorado & Santa Fe.—Daugherty, I. T., east into asphalt deposits. Right of way granted by Congress.

Gulf, Louisiana & Great Northern.—Vermilion Bay, La., north to the Arkansas State Line under contract to the St. Louis Construction Co., 101 Chemical Building, St. Louis, Mo. Work begun in January on section from Alexandria, Mo., to Arcadia, 125 miles. Joseph J. Waitz, Atchison, Kan., President.

Gulf, Texas & Northern.—Orange, Tex., north about 200 miles via San Augustine to Marshall. George W. Bancroft, Orange, among those interested.

Highland & St. Joseph.—Severance, Kan., north 7.5 miles to Highland. Contracts to be let soon. W. M. Brown, Highland, President.

Hinton, New River & Western.—Pearisburg, Va., northwest about 140 miles via Hinton, W. Va., to Charleston, W. Va. J. T. McCreery, Hinton, President and General Manager.

Hot Springs Terminal.—Terminals at Hot Springs, Ark., five miles. Grading in progress. J. P. Mellard, Hot Springs, Ark., President.

Hutchinson & Southern.—Blackwell, Okla., to a junction with the Atchison, Topeka & Santa Fe, 15 miles.

Idaho.—Ballard's Landing, Ore., on the new Northwest, northeast 19 miles to the Seven Devils' Copper Mines. Grading completed. Isaac E. Blake, 11 Broadway, New York, Treasurer and General Manager.

Illinois Central.—Extension of the Tallahatchie branch of the Yazoo & Mississippi Valley from Black Bayou, Miss., southeast 20 miles to Greenwood. J. C. Neely, Philip, Miss., contractor. Grading in progress.

Indiana & Southeastern.—Anderson, Ind., east 13 miles to Muncie, nearly completed.

Jasper, Southern.—Kirbyville, Tex., northwest 20 miles to Jasper. Grading completed. W. W. Blake, Jasper, Tex., Chief Engineer.

Jonesboro, Lake City & Eastern.—Lake City, Ark., east 15 miles toward Osceola. A. J. Kerfoot, Jonesboro, Ark., General Manager.

Kansas & Southeastern.—Hunnell, Kan., on the Atchison, Topeka & Santa Fe southwest through Blackwell, Okla., Ter., to Tonkawa, 27 miles. Completed to Blackwell. Francis S. Eaton, Kansas City, Mo., contractor. Dwight H. Nassau street, New York City, Eastern representative.

Kansas & Texas Coal.—Ardmore, Mo., to Brevier, about 10 miles. Contracts let. George B. Leighton, St. Louis, Mo., Vice-President.

Kansas City, Eldorado & Southern.—Walker, Mo., to Eldorado, 15 miles. Work in progress. B. A. Aldrich, 900 Rialto, St. Louis, Mo., interested.

Kansas City, Northeastern & Gulf.—Kansas City, Kas., south to a point on the Gulf of Mexico in Texas. J. J. Squires, Kansas City, Mo., President.

Kansas City, Osceola & Southern.—Osceola, Mo., southeast 36 1/2 miles to Bolivar, being built for the St. Louis & San Francisco. George S. Good & Co., of Lock Haven, Pa., contractors.

Kansas, Oklahoma Central & Southwestern.—Coffeyville, Kan., southwest 350 miles to Vernon, Tex. Toledo Construction Co. of Toledo, O., contractors. J. H. Bartles, Bartlesville, I. T., President.

Kennebec & Franklin.—Augusta, Me., northwest about 45 miles via Manchester to Mt. Vernon. Preliminary surveys made. J. C. Vick, Augusta, President.

Kern & Western.—Extension from Cainsville, Mo., or some other point, southwest about 30 miles to Pattonsburg. Bonds issued.

Lake Erie & Western.—Akron, O., east 85 miles to Newcastle, Pa. George Hugill, Akron, contractor.

Lake Shore & Michigan Southern.—Elkhart & Western extension from Mishawaka, Ind., west four miles to a connection with the Vandallia at South Bend.

Las Vegas, Mora & Taos.—Las Vegas, N. Mex., northwest 85 miles to Taos. F. A. Manzanarez, Las Vegas, N. Mex., President.

Laurel & Northwestern.—Laurel, Miss., northwest 60 miles to Raleigh. Ten miles under contract. M. W. Woodbury, Laurel, Miss., General Manager.

Lehigh & Hudson River.—Franklin Junction, N. Y., to mine, two miles.

Little River Valley.—Extension from Morris Ferry, Ark., west eight miles to the Indian Territory line. Partially completed. D. C. Richardson, Horatio, Ark., President.

Los Angeles Terminal.—Los Angeles, Cal., east about 40 miles to Pomona and beyond.

Louisiana & Arkansas.—Stamps, Ark., south 40 miles to Cotton Valley. Work in progress.

Louisiana & Northwest.—Extension from Homer, La., northwest 36 miles to Magnolia, Ark. Track laying in progress. Work done by the company. J. T. Beardsley, Gibsland, La., General Manager.

Louisville & Southeastern (successor to the Richmond, Nicholasville & Beattyville).—Extension from Irvine, Ky., east 36 miles to Beattyville. Adolph Segal, Philadelphia, President.

Luckanute Valley & Western.—Falls City, Ore., to Salem, 28 miles. Section to Dallas, eight miles, building. Surveyed to Salem. J. S. Talbot, Falls City, President.

McCloud River.—McCloud, Cal., east 50 miles to Altruras. W. W. Van Arsde, Crocker Building, San Francisco, General Manager.

Mansfield Short Line.—Shelby, O., southwest 19 miles to Lucas. Crouch Construction Co., Chicago, contractors. C. W. French, Mansfield, O., President.

Marshall, Timpson & Sabine Pass.—Timpson, Tex., on the Houston, East & West Texas, north 20 miles via Russellville to Carthage. Completed in 1896 to Russellville. Avery & Co., Timpson, have the contract from Russellville to Carthage, 12 miles.

Memphis, New Orleans & Texas.—Memphis, Tenn., along the west bank of the Mississippi to some point on the south line of Arkansas. Surveys in progress. E. L. Phillips, Manager of the Delta Co-operative Co., Milwaukee, Wis., among those interested.

Merchants & Manufacturers' R.R. Co.—Belt line in Detroit, along the river front. George H. Barbour, Detroit, Mich.

Miami River & Belt.—Minster, O., through Sidney to Lake View, 40 miles. Grading in progress. T. H. Mathers, Sidney, O., President.

Michigan.—Balch & Peppard, Minneapolis, Minn., have the contract for building about five miles of road to connect the Arnold and Copper Falls mines, near Houghton, Mich. Work in progress.

Millford, Matamoras & New York.—Port Jervis, N. Y., across the Delaware River to Matamoras, Pa. Plans approved by the New York State Railroad Commission. L. Marthmont, Millford, Pa., a Director.

Minneapolis, Anoka & Rainy Lake.—Minneapolis, Minn., north about 200 miles through Anoka, Cambridge, and Mora to Grand Rapids. Senator Washburn, of Minneapolis, among those interested.

Mississippi River, Hamburg & Western.—Hamburg, Ark., east 40 miles to Gaines' Landing. Four miles of track laid. James M. Parker, Hamburg, Ark., General Manager.

Mississippi Valley Coal Co.—Winfield, Ala., on the Kansas City, Ft. Scott & Memphis, southwest about 50 miles to West Point, Miss. Work to begin soon.

Missouri & Iowa Southern.—Sedalia, Mo., north 50 miles to Miami. Sedalia Construction & Equipment Co., builders. A. L. Strang, Sedalia, Mo., Vice-President and General Manager.

Missouri Pacific.—Little Rock, Ark., west about 165 miles to Greenwood, surveyed.

Mobile & Ohio.—Belt of six miles from Pritchards around the city of Mobile, Ala. Work being done by the company.

Mobile, Jackson & Kansas City.—Mobile, Ala., to Jackson, Miss., 133 miles. Completed beyond Merrill City, Miss.

Monroe Ry. & Construction Co.—Monroe, La., Southwest via Winnfield, 89 miles, to Natchitoches. L. D. McLean, Monroe, President. Grading in progress.

Montgomery, Hayneville & Camden.—Montgomery, Ala., southeast 75 miles to Camden. A further extension proposed from Camden to the Gulf of Mexico. Sol. D. Bloch, Montgomery, Ala., President.

Moscow & Eastern.—Moscow, Ida., east 35 miles to the Potlatch River. George Creighton, Moscow, President.

Moscow, Camden & San Augustine.—Moscow, Tex., northeast about 50 miles to San Augustine. W. F. Carter, Camden, Tex., President.

Moore County & Western.—Concord, N. C., east 37 miles to Craigswine. Central office, Aberdeen, N. C.

Muscogee, Oklahoma & Western.—Talequah, I. T., to Enid, Okla., about 200 miles, surveyed. W. H. Herbert, Cleveland, Okla., I. T., General Manager.

Nashville, Chattanooga & St. Louis.—Chickamauga Station to Chickamauga Park, Ga., about six miles. Preliminary surveys.

Natchez, Columbia & Mobile.—Branch of three miles, building. C. S. Butterfield, Norfolk, Miss.

New England.—Norwich & Worcester extension from Allyn's Point south six miles to Groton. Work in progress.

New York & Ottawa.—Molra, N. Y., north to Canadian line, 15 1/2 miles. Work on the Canadian side to Ottawa, Ont., practically completed. Geo. W. Parker, Cornwall, Ont., President.

New York & Pennsylvania.—Extension from Canisteo, N. Y., northwest about eight miles to Hornellsville. Extension from Oswayo, Pa., northwest 42 miles to Olean, N. Y.

New York, New Haven & Hartford.—Extension of the Providence Division in Boston, Mass., from Dartmouth St. to the intersection of the Boston & Albany, about 3,000 ft. Under contract.

Norfolk & Portsmouth Belt Line.—Belt Line around Norfolk and Portsmouth, Va., 6 1/2 miles. D. F. Keenan, Germantown, Pa., contractor. Work in progress. Joseph U. Crawford, Norfolk, Va., Chief Engineer.

Norfolk & Southern.—Snowden, N. C., southeast about 30 miles along Currituck Sound to Powell's Point. Surveyed.

North Bend & Kettle Creek.—Proposed extension from Brook's Siding, Pa., 6 1/2 miles, to Oleana. F. A. Blackwell, Oleana, Pa., General Manager.

Northern Pacific.—Gaylord & Ruby Valley extension from Gaylord, Mont., south 22 miles to Twin Bridges. Nearly completed. Cook & Woldson, Helena, Mont., contractors. Aberdeen, Wash., to Hoquiam, 4.6 miles, under construction. Spokane & Palouse Branch from Pullman, Ida., to Lewiston, 20.6 miles, under construction. Vancouver, Wash., south about 35 miles along the Columbia River to Kalama. Work in progress.

Northwest.—Nagle, Ore., on the Oregon Short Line, north down the valley of the Snake River, 55 miles, to Oxbow and Ballard's Landing in the Seven Devils' Mining District. Grading at both ends in progress. Lucien Eaves, 11 Broadway, New York, Secretary.

Oconee & Western.—Hawkinsville, Ga., southwest about 30 miles to Cordele. Surveyed. H. A. Clare, 45 Exchange Place, New York City, President.

Ohio River & Charleston.—Extension from Gaffney, N. C., to Spartanburg, 24 miles.

Ohio River & Lake Erie.—Bergholz, O., southeast to Steubenville, or to Wheeling, W. Va. Surveys completed.

Orange, Call & Pine Belt.—From Orange, Tex., via Call to Jasper, 63 miles. Completed from Salem to Call, 14 miles. Dennis Call, Orange, Tex., President.

Pacific & Navigation.—Seward, Alaska, north via the White Pass to Lake Bennett, with further extension to Fort Selkirk, about 400 miles. Pacific Contract Co., of Seattle, Wash., contractors for the first 40 miles. E. C. Hawkins, Seattle, Wash., General Manager.

Pecos Valley & Northeastern.—Extension from Roswell, N. Mex., northeast 208 miles to Amarillo, Tex. S. H. Mallory & Co., Charlton, Iowa, contractors. J. J. Hagerman, Colorado Springs, Col., President.

Pennsylvania.—Cumberland Valley extension through Waynesboro, Pa., south 3/4 mile. Work in progress.

Penn Yan & Pennsylvania.—Penn Yan, N. Y., southwest 33 miles to Savona. Partially graded. J. D. Nares, Corning, N. Y.

Pensacola & Northwestern.—Pensacola, Fla., to Memphis, Tenn., 440 miles. S. N. Praag, Pensacola, President; J. Rivers Carter, Birmingham, Chief Engineer.

Peoria & St. Louis.—Pekin, Ill., south 55 miles to Springfield. Dwight L. Wing, 225 South Spring street, Springfield, Ill., general contractor.

Philadelphia, Reading & New England.—Tarrifville, Conn., to Springfield, Mass., 18 miles, to be built after reorganization is effected.

Pittsburgh & Lake Erie.—Gibson, Pa., up Speer's Run two miles to coal mines. Grady, Coda & Co., Pittsburgh, Pa., contractors. Grading nearly completed.

Pittsburgh, Brady's Bend & Lake Erie.—East Brady, Pa., on the Allegheny Valley, southwest 17 miles to Butler, on the Pittsburgh, Bessemer & Lake Erie. Grading begun. Joseph Pool, 62 Cedar Street, New York, President.

Pittsburgh, Connellsville & Baltimore.—From the Baltimore & Ohio in Fayette County, Pa., to a point on the Pennsylvania, near Fairchance, about 14 miles. R. E. Murdock, Ingham, Pa., President.

Pittsburgh, Johnstown, Ebensburg & Eastern.—Altoona & Beach Creek extension from Phillipsburg, Pa., west about 60 miles to Johnstown. Surveyed.

Planters' Terminal.—Sherman, Tex., south 16 miles via Howe to Van Alstyne. Burton R. Stare, of Sherman, Tex., President.

Plant System.—South Western Alabama extension from Newton, Ala., southwest 36 miles to Eiba. Nearly completed. W. F. Vandiver, Montgomery, Ala., contractor.

Plymouth County.—East Weymouth, Mass., southeast about 25 miles to Hanover. Surveys completed. John F. Simmons, Exchange Building, Boston, President.

Portland & Rumford Falls.—Extension of the Otis Falls Branch from Canton, Me., east 10 miles to Chisholm's Mills. Contracts let.

Portland, Vancouver & Yakima (successor to the Vancouver, Klickitat & Yakima).—Vancouver, Wash., northeast about 160 miles to North Yakima. Of this 17 miles in operation. Surveys for balance in progress. James H. Hubbard, Vancouver, Wash., General Manager.

Quakertown & Eastern.—Quakertown, Pa., northeast 15 miles to Eggleston. Track laid to Springtown, nine miles. H. F. Baker, Quakertown, Pa., contractor. John Jameson, Quakertown, President.

Queen Anne's.—Queenstown, Md., north about 54 miles to Child's Station.

Raleigh & Cape Fear.—Raleigh, N. C., south about 35 miles to Lillington. Seven miles graded, five miles track laid. John A. Mills, Raleigh, N. C., President.

Rice Lake, Dallis & Menomonee.—Extension from Cameron, Wis., to Menomonee, 48 miles.

Richmond, Pittsburgh & Carolina.—Ridgeway, N. C., north 106 miles to Richmond, Va. Work in progress between Petersburg and Ridgeway, N. C., about 38 miles. Gen. J. B. Negley, 41 Broadway, New York City, Vice-President.

Rio Grande & Pagosa Springs.—Edith, Colo., north 30 miles to Pagosa Springs. Completed to Price. E. M. Biggs, Edith, Colo., President.

Rosenberg, Damon Mound & Gulf.—Rosenberg, Tex., south about 20 miles to Damon Mound. Surveys in progress. S. C. Brasher, Houston, Tex., President.

Sabine Terminal & Union Depot Co.—From the terminus of the Kansas City, Pittsburg & Gulf, at Port Arthur, south nine miles to Sabine Pass. About one mile of track laid. Joseph O. Osgood, Sabine Pass, Tex., President.

St. Louis & San Francisco.—St. Louis & Oklahoma City extension from Sapulpa, I. T., west 103 miles to Oklahoma City, Okla. Contract let.

St. Louis, Mansfield & Ava Southern.—Mansfield, Mo., south to Ava. Ozark Construction Company, Springfield, Mo., general contractors.

St. Louis, Perry & Chicago.—Grafton, Ill., to Macomb, 150 miles. Moulton & Keene, 102 North Fourth street, St. Louis, Mo., contractors.

St. Louis, Sloom & Southern.—Projected from St. Louis, Mo., southwest about 350 miles to Fort Smith, Ark. H. D. Mackey, Pomona, Mo., President.

San Antonio & Gulf.—Stockdale, Tex., to Galveston, 160 miles.

San Antonio, Llano & Northern.—Strong, Tex., south about 45 miles to Comanche. Surveys in progress. William Martin, President of the First National Bank of Comanche, a Director.

San Francisco & San Joaquin Valley.—Extension from Stockton, Cal., west to Point Richmond, opposite San Francisco, 75 miles. Now building. Connecting link from Visalia, Cal., east 25 miles to main line at Corcoran Junction, under construction. W. B. Storey, Jr., 321 Market street, San Francisco, Cal., Chief Engineer and General Superintendent.

San Jacinto, Lake View & Northern.—Extension from San Jacinto, Cal., to Lake View, 10.2 miles. E. C. Proctor, San Jacinto, contractor. W. C. Nevin, Los Angeles, Cal., President.

Santa Fe & Grand Canyon.—Williams, Ariz., on the Santa Fe Pacific, north 73 miles via Flagstaff to the rim of the Grand Canyon of the Colorado. W. M. O'Neill of Prescott, Ariz., General Manager.

Santa Fe, Prescott & Phoenix.—Prescott & Eastern extension from the P. & E. Junction near Prescott, south 26.4 miles to Mayer. Grading in progress. W. A. Drake, Chief Engineer.

Seaboard Air Line.—Lawrenceville, Ga., southeast 11 miles to Logansville. A. C. Wright & Co., 807 East Clay Street, Richmond, Va., contractors.

Seaboard of Alabama.—Extension from Tiger, Ala., through Chatham 74 miles, of which 54 miles is completed. J. M. Van Deusen, Fairfield, Ala., General Manager.

Shelton Southwestern.—Summit, Wash., southwest five miles to Prairie Lake. Grading in progress. Further extension proposed southwest 30 miles to Elma. W. H. Kneeland, Shelton, Wash., General Manager.

Sioux City, Chicago & Baltimore.—Sioux City, Ia., southeast 512 miles to St. Louis, Mo. Proposes to begin work this year. T. P. Geer, Sioux City, Ia., President.

Smith's Ferry.—Lisbon, Pa., to East Liverpool, 29 miles. J. L. B. Dawson, Beaver Falls, Pa., President.

Snake River Valley.—Amatilla, Ore., to Wallula, Wash., and thence along the Snake River Valley to Huntington, Ore. Surveys made. W. H. Kennedy, Portland, Ore., Chief Engineer.

South Carolina & Georgia.—Extension from Augusta, Ga., southwest about 150 miles to Albany, on the Central of Georgia. New section from Cordele to Albany, 35 miles.

Southern.—Leeds, Ala., to the ore mines of the Sloss Iron & Steel Co. Grading in progress. Stevenson, Ala., northeast about 40 miles to Chattanooga, Tenn. Preliminary surveys made.

Southern Pacific.—Extension of Thibodeaux branch from Thibodeaux, La., northwest about 15 miles to Napoleonville. Extension of Visalia branch from Visalia, Cal., southeast 12 miles to Exeter.

Speedwell Lake.—From the terminus of the Rockway Valley at Watnong Station, N. J., southeast one mile in Morristown. Surveys completed. Richard B. Morriarty, Morristown, President.

Staunton & Augusta.—Staunton, Va., south about 12 miles to a point on the Norfolk & Western with extension north to Elkins, W. Va., and thence to Pittsburgh, Pa. E. C. Vincent, Staunton, Va., President and General Manager.

Stockton & Tuolumne.—Stockton, Cal., east about 35 miles to Summersville. Grading in progress. Annie Kline Rikert, Grand Hotel, San Francisco, Cal., President.

Sugar Creek.—McDonald, W. Va., up Sugar Creek, down Park's Branch, then up Pink Creek to Raleigh Courthouse, 15 miles. J. W. Davis, Coffman, W. Va., President.

Sumter & Wateree.—Sumter, S. C., west 15 1/2 miles to Middleton. George D. Blanding, Sumter, among the incorporators.

Tacoma & Columbia River.—South Park, Wash., south about 200 miles to Dallas, Ore. William Bailey, 50 Broadway, New York City, President.

Tallahassee Southeastern.—Tallahassee, Fla., southeast about 100 miles to the Suwannee River. Owned and being built by the Florida Construction Co. R. L. Bennett, Tallahassee, Fla., Vice-President and General Manager.

Tecumseh.—Tecumseh, Okla. Ter., to Stroud, 38 miles. E. C. Nichols, Tecumseh, President.

Tennessee Central.—Extension to Knoxville, Tenn., east about 93 miles. Most of the bonds said to have been subscribed. Jere Baxter, Nashville, Tenn., President.

Terminal Railroad Association of St. Louis.—Extension of Belt Line in the city of St. Louis. Grading partially completed. E. P. Bryan, St. Louis, General Manager.

Terminal Railway of Buffalo.—Blasdel, N. Y., to Dennew, 11 miles. Smith & Co., 723 Guarantee Building, Buffalo, contractors. Ten miles of temporary track laid to transport materials. Grading completed. W. J. Wilgus, Grand Central Station, N. Y., Engineer.

Texas & Pacific.—Wacom, Tex., via Greenwood, La., to Reisor, La., 12 1/2 miles. Grigsby Construction Co., Dallas, Tex., contractors.

Texas Central.—From Albany, Tex., to Stanford, 40 miles. Chas. Hamilton, Waco, Tex., General Manager. Toledo & Northwestern.—Charlotte, Mich., south 24 miles to Albion. Grading completed. Albion, south 16 miles to Hanover. G. E. Murdock, Albion, Mich., President.

Toledo & Ottawa Beach.—Toledo, O., north 40 miles to Trenton, Mich., on the Detroit & Lima Northern. Ferguson Contracting Co., New York, contractors. Work in progress. Joseph K. Duffy, Toledo, O., Vice-President.

Tredeggar Mineral.—Tredeggar Junction, Ala., to Iron Mountain, six miles. J. W. Burke, Dickinson, Ala., President and General Manager.

Tuscarora Valley.—Port Royal, Pa., southwest 31 miles to McConnellsburg. T. S. Moorhead, Port Royal, President and General Manager.

Union Railway (Belt Line).—Extension of six miles of main line from Memphis, Tenn., and four miles of spur track. H. L. Brinkley, Memphis, Tenn., President.

Vining & Coleman.—From a point on the Gulf, Colorado & Santa Fe six miles south of Coleman, south 20 miles to the Vining Coal Mines on the Colorado River. Contract let. George W. Speed, Austin, Tex., Chief Engineer.

Virginia, Fredericksburg & Western.—Millenbeck, Va., along the northern neck of Virginia, to Davis, W. Va. The Union Construction Co. (J. W. Coffin, 18 Wall Street, New York), has the contract. Grading in progress.

Wabash.—Toledo, O., west to Montpelier, near the Indiana State line. Surveyed.

Waco & Sabine Pass.—Waco, Tex., southeast 61 miles to the Leon County line. Final surveys completed. Further extension proposed to Sabine Pass; in all, 240 miles. R. P. Duncan, Waco, Tex., Vice-President.

Washington County.—Ellsworth, Me., on the Maine Central, northeast about 104 miles along the coast to Calais. E. J. Cooley & Co., of Nebraska, have the contract between Cherryfield and Whitneyville, 23 miles. Part of the road completed. William Barclay Parsons, 22 William Street, New York City, Chief Engineer.

Washington, St. Mary's Bay & Point Lookout.—Washington, D. C., southeast to Point Lookout, Md. Contract let for first 18 miles. Col. A. B. Linderman, Philadelphia, Pa., President.

Washington, Westminster & Gettysburg.—Washington, D. C., north 90 miles to Gettysburg, Pa. Rockville to Gettysburg, 76 miles, under contract to the North & South Construction Co. James B. Colgrove, Washington, D. C., President.

Waycross Air Line.—Nicholls, Ga., west 12 miles to Douglas. J. H. Powers, Waycross, contractor.

Wellington & Powellsville.—Ahsokie, N. C., south 19 miles to Windsor. Grading completed. J. W. Branning, Edenton, N. C., President.

Western American Coal Co.—Carbonado, Wash., on the Northern Pacific, to the mines of this company at Fairfax, seven miles. Contracts let. T. B. Corey, Seattle, Wash., General Manager.

Western Maryland.—Washington & Franklin cut-off from Hagerstown, Md., east to a point on the main line near Altenwald, Pa. J. R. Cerpell & Co., Louisville, Ky., contractors. Several miles graded.

West Side Belt.—Pittsburgh, Pa., to Peter's Creek or Finleyville, 12 miles. A. S. Petrie, Pittsburgh, Pa., Secretary.

West Virginia Central & Pittsburgh.—Beverly, Md., south 11 miles to Huttonsville. Grading in progress.

West Virginia Short Line.—Clarksburg, W. Va., northwest 25 miles to Martinsville on the Ohio River. Surveys completed. T. M. Jackson, Clarksburg.

White River, Lonoke & Western.—Wooley, Ark., on the St. Louis, Iron Mountain & Southern, northwest via Lonoke to Seaton. Completed to Lonoke. Work in progress between Lonoke and Seaton, 11 miles. J. N. Wooley, Jacksonville, Ark., General Manager.

Wisconsin & Quebec.—Extension from Albion, Me., north 13 1/2 miles to Pittsfield nearly completed. H. W. Martin, Murray Hill Hotel, New York City, sub-contractor. Extension from Portland to Monson Junction, 39 miles, surveyed. Extension from Monson north 12 miles to Greenville. Extension from Week's Mills northeast 46 miles to Farmington. W. F. P. Fogg, Wiscasset, Me., General Manager.

Wisconsin, Inland Lakes & Chicago.—Chicago, northwest to Rhineland, Wis., with branches to Madison and Milwaukee, Wis., in all about 500 miles. Mortgage deed filed. E. R. Bryant, Princeton, Ill., interested.

Wyoming & Black Hills.—Belle Fourche, S. D., west 18 miles to Barrett, Wyo. Crouch Construction Co., Chicago, contractors. George M. Nix, Dubuque, Ia., President.

Yellow River.—Florida, Fla., to Elba, about 30 miles. W. B. Wright, Pensacola, Fla., General Manager.

Canada.

Atlantic & Lake Superior.—Extension of Bale des Chaleurs Division, from New Carlisle, Que., northeast about 23 miles to Gaspe. Under construction. C. R. Scoles, New Carlisle, contractor. Extension from Levis southwest 110 miles to Sorel under construction.

Canadian Pacific.—Crows Nest Pass extension from Lethbridge, B. C., west 330 miles to Nelson. Track laid for 118 miles. Columbia & Western extension from Robson, B. C., west 100 miles to Midway. Mann, Larson & Foley Bros., contractors. Midway to Pentleton Mills protected. Extension of the Nakusp & Slocan from Three Forks B. C., east about 15 miles to White Water, favorably reported by the Dominion Railway Committee, Toronto, Ont., north to Sudbury. Surveys in progress.

Central Ontario.—Ormsby to Bancroft, 20 miles. Coast Railway of Nova Scotia.—Yarmouth, N. S., along the Atlantic Coast to Lockeport, 97 miles. Completed to East Pubnico, 31 miles, and 20 miles from East Pubnico to Barrington now under construction. Surveys in progress from Lockeport to Halifax, 110 miles. H. J. Townsend & Co. of Yarmouth, N. S., contractors.

Great Northern (Canada).—Montcalm, Que., northeast via St. Novert to Joliette. Surveys in progress.

Great Northwest Central.—Hamota, Man., west 50 miles toward Battleford. Surveys in progress.

Lake Erie & Detroit River.—Bridgetown, Ont., northeast about 65 miles to St. Thomas.

Lake Manitoba Ry. & Canal Co.—Extension from Sifton, Man., north to the Saskatchewan River. About 65 miles to be built this year.

Midland of Nova Scotia.—Windsor, N. S., east 60 miles to Truro. Grading in progress. W. O. Strachan, Montreal, Que., President.

Montfort Colonization.—Armide to Gatineau, Que., 85 miles.

Nelson & Bedlington.—Bonner's Ferry, Idaho, on the Northern Pacific, north 52 miles along the valley of the Kootenay River to Kootenay Lake, B. C. Surveys completed. N. D. Miller, Nelson, B. C., Chief Engineer.

Newfoundland.—Brigus Junction, Nfld., via Clarke's Beach to Tilton; Harbor Grace to Carbonear. Track laid for 25 miles on the two extensions. Extension to the Placentia Branch from Placentia Junction.

Newfoundland & Western extension from Whiteburne to Port-a-Basque. Burnt Bay across to Burnt Bay to Notre Dame Bay. All building. Robert G. Reid, St. Johns, Nfld., lessee.

Northern Pacific.—Belmont, Man., west about 51 miles to Hartney. James D. McArthur, Winnipeg, Man., contractor.

Nova Scotia Southern.—Annapolis, N. S., to Liverpool, with several branches. Robert G. Hervey, 80 Broadway, New York City, among those interested.

Ontario & Rainy River.—Port Arthur, Ont., a point on the Canadian Pacific, west about 24 miles to Fort Frances. New subsidy of \$120,000 granted.

Ottawa & Gatineau.—Gracefield, Que., north 24 miles to Maniwaki. H. J. Beemer, Montreal, Que., contractor. P. W. Ressenway, Ottawa, Ont., General Superintendent.

Pembroke Southern.—Pembroke, Ont., southeast about 21 miles to Golden Lake. Subsidy of \$10,500 for the first

3.5 miles. J. S. Sherwood of Einsdale, Ont., has the contract for five miles at the Golden Lake end. William Russell, Jr., Pembroke, Ont., Chief Engineer.

Pontiac Pacific Junction.—Aylmer, Que., Northwest nine miles to Hull, under construction. Waltham, Que., to Pembroke, 13 miles. G. C. Dunn, Ottawa, Ont., Acting Chief Engineer.

Port Arthur, Duluth & Western.—Branch from Port Arthur, Ont., to Kakabeka Falls.

Restigouche & Western.—From a point on the Bay of Chaleurs southwest about 110 miles to the St. John River in New Brunswick. Malcom & Ross, St. Leonards, N. B., contractors.

Toronto & Hudson Bay.—Toronto, Ont., north through Barrie and Parry Sound to Moose Factory, a point on the James Bay, an arm of Hudson Bay, with a branch extending to the North Pacific Junction RR. near Gravenhurst, and another extending southward from the Tanagini Lake to the North Pacific Junction RR. near North Bay. John Shaw, Mayor of Toronto, is among those interested.

Vancouver, Victoria & Eastern.—Vancouver, B. C., east into the interior about 325 miles, to be owned by McKenzie & Mann of Vancouver, B. C., and Toronto, Ont.

Winnipeg & Southeastern.—Winnipeg, Man., southeast 80 miles to a point near White Mouth Lake. Contracts let from Winnipeg to St. Anne des Chenes. Government subsidy of \$8,000 per mile.

Mexico.

Chihuahua & Pacific.—Chihuahua west 124 miles to Guerrero. The Nassau Construction Co., New York City, contractors. Two miles of track laid. Extension of 250 miles more proposed. Edward S. Safford, of Guerrero, Mex., Chief Engineer.

Hidalgo & Northeastern.—Sotolan northeast 159 miles to Tuxpan. Completed to Tortugas, 7.5 miles. Tomas Mancera, Mexico City, Traffic Manager.

Interoceanic of Mexico.—Loop line from Cuantla, to Chitela, 41 miles. Surveys in progress. Andrew Blake, Mexico City, Chief Engineer.

Jalapa Railroad & Power Co.—Concession for land from Jalapa south about 50 miles to Cordova. Completed 13.6 miles from Jalapa to Coatepec. H. T. Green, Jalapa, General Superintendent.

Mexican Central.—Jimenez, southwest 56 miles to Paranal. Track laid for 27 miles. H. R. Nickerson, Mexico City, General Manager.

Mexican Industrial.—Belt line around the City of Mexico, 9.5 km. (5.9 miles), with a connecting line to San Nicholas, making a total length of 28.5 km. (16.5 miles). Belt line completed. S. W. Reynolds, Mexico City, President.

Mexican International.—Reata, Mex., southeast 72 miles to Monterrey. Grading completed. W. T. Robertson, Eagle Pass, Tex., contractor.

Mexican National.—Extension from Patzcuaro west 54 miles to Uruapan. Grading in progress. W. G. Raoul, 6 Wall Street, New York, President.

Mexican National Construction Co.—Collima, north about 150 miles to Guadalajara on the Mexican Central in the State of Jalisco. Senor Ignacio Borda, City of Mexico, has the concession from the Mexican government.

Mexican Sulphur Co.—Mouth of the Colorado River in Mexico to San Diego, Cal. Also to Yuma, Ariz., with branch to San Diego. Partially surveyed. J. A. Dubbs, Ventura, Cal., General Manager. Main office, Pittsburgh, Pa.

Mexico, Cuernavaca & Pacific.—Mexico City south through Chilpancingo to Acapulco on the Pacific coast, about 317 miles. Completed to Iguala, 145 miles. G. A. Stranahan, Mexico City, Construction Engineer.

Michoacan & Pacific.—Yurecuaro, Mex., southeast 186 miles to Arlo. Grading completed for about 19 miles. L. R. Gordon, Zitacuaro, Mex., General Superintendent.

Monterrey & Mexican Gulf.—Tampico, Tamaulipas, south about 150 miles to the City of Mexico. Surveys completed. A. Monmon, Monterrey, General Manager.

Torres & Prietas.—Torres to Santa Cruz, 65 miles. Work being done by the company. J. H. Thomas, Torres, Sonora, Mex., Chief Engineer.

Vanegas, Cedral & Rio Verde.—Matchuala to Riverde, 270 miles. B. Escontria, San Luis Potosi, Mex., General Manager.

Vera Cruz & Pacific.—Vera Cruz southeast through the State of Vera Cruz, 400 km. (249 miles) via Tuxtepec and Paso San Juan to Santa Lucrecia on the National Tehuantepec with branches. Alfred Bishop Mason, 7 Pine Street, New York City, and Apartado 130, City of Mexico, President. Bids have been invited.

Western of Mexico.—Cullacan, Linaloa, east via Papudos Heights to Durango. Graded for about three miles. Subsidy from the Government of \$8,500 per kilometer. G. R. Douglass, Mazatlan, General Manager.

Yuma & Gulf of California.—San Jorge, on the Gulf of California, northwest 61 miles to the Arizona boundary, thence up the Colorado River to Yuma, Ariz., 15 miles, total 76 miles. Capt. Alfonso B. Smith, Los Angeles, Cal., holds the concession from the Mexican government.

Specifications.

June 17, p. 425, we printed a part of a paper by Mr. McMynn on "Specifications," read before the Western Railway Club. A few notes from the discussion follow:

President Delano.—The next business before the meeting is the discussion of the paper on "Specifications," by Mr. John C. McMynn. The advance sheets of this paper have been sent to all the members, and the paper is now open for discussion.

Mr. Waitt, we had the pleasure of listening to a paper from you on car specifications. Possibly you would like to give us your views on Mr. McMynn's paper.

Mr. A. M. Waitt—I recently had a letter from a purchasing agent of a large system in connection with the matter of air brake hose, and he said they had no specifications and no requirements for a material of that kind; they intended to buy, as a rule, of the best manufacturers, and asked such manufacturers to bid on the material, and they purchased from the party who gave the lowest bid. I think that is a very dangerous practice, not only with the specific article of air hose, but very dangerous in connection with other material. If anyone makes specifications for an article he should see that the specifications are followed. I know of specifications put out in the market and material purchased for them in the case of two or three railroad companies where it is absolutely certain that the tests are not made and inspection is not made of the material to see whether it fills the specifications or not.

Mr. Charles L. Sullivan.—The point that Mr. Waitt mentioned brings up another matter on which I might make a few remarks. After we have the specifications, what shall be done with them? To illustrate what I mean, I will say that when I was

acting as inspector for a railroad a number of years ago, I was inspecting all the material for a lot of 400 or 500 coal cars, and while the iron was being rolled I rejected quite a lot of it of different sizes, for very good causes, but my ruling was set aside by the superintendent of motive power of the road. I was trying to follow the specifications, but I might just as well have been sent home with them. The manufacturer of the iron took advantage of the fact that my ruling was set aside, and my life was made miserable during the rest of my stay at that mill. I thought the officers of the road made a mistake in overruling my judgment when it was plain that I was right. I thought so then and I still think so. They should have withdrawn the specification as well as the inspector, or should have sustained the inspector as well as the specifications.

Mr. William Forsyth—At the end of Mr. McMynn's paper he says that he wishes that it could be made a part of our club work, by means of committees, to make recommendations for revision of specifications. I believe that we could do some work in that direction, and I would make the following motion: That it be made a part of our programme for the next year to appoint a committee to review the specifications for iron and steel which are in general use by railroads.

Mr. G. W. Rhodes—On the road that I represent the effort is to have specifications for everything, to order no material by name, but to order it by the

Center Bearings or Side Bearings.

At the May meeting of the Western Railway Club, a very interesting discussion took place on the question of stiff bolsters and center or side bearings. Extracts from that discussion follow:

President Delano—The next regular business of the meeting is the discussion of the subject, which reads as follows:

"With the Very Heavy Capacity of Cars Now Being Built, is it Not Advisable to Transmit the Weight from the Body Bolster to the Truck Bolster. Equally Distributed Between Center Plate and Side Bearings, Instead of Carrying All on the Center Plate?"

This subject fits in very well with what we have been discussing in the April "Proceedings." Prof. Goss has given us a very complete paper on atmospheric resistance of trains, and Mr. Quereau has given us an interesting paper on tonnage resistance, and this subject suggests another kind of resistance, that is, the resistance on the curves due to cars bearing hard on their side bearing.

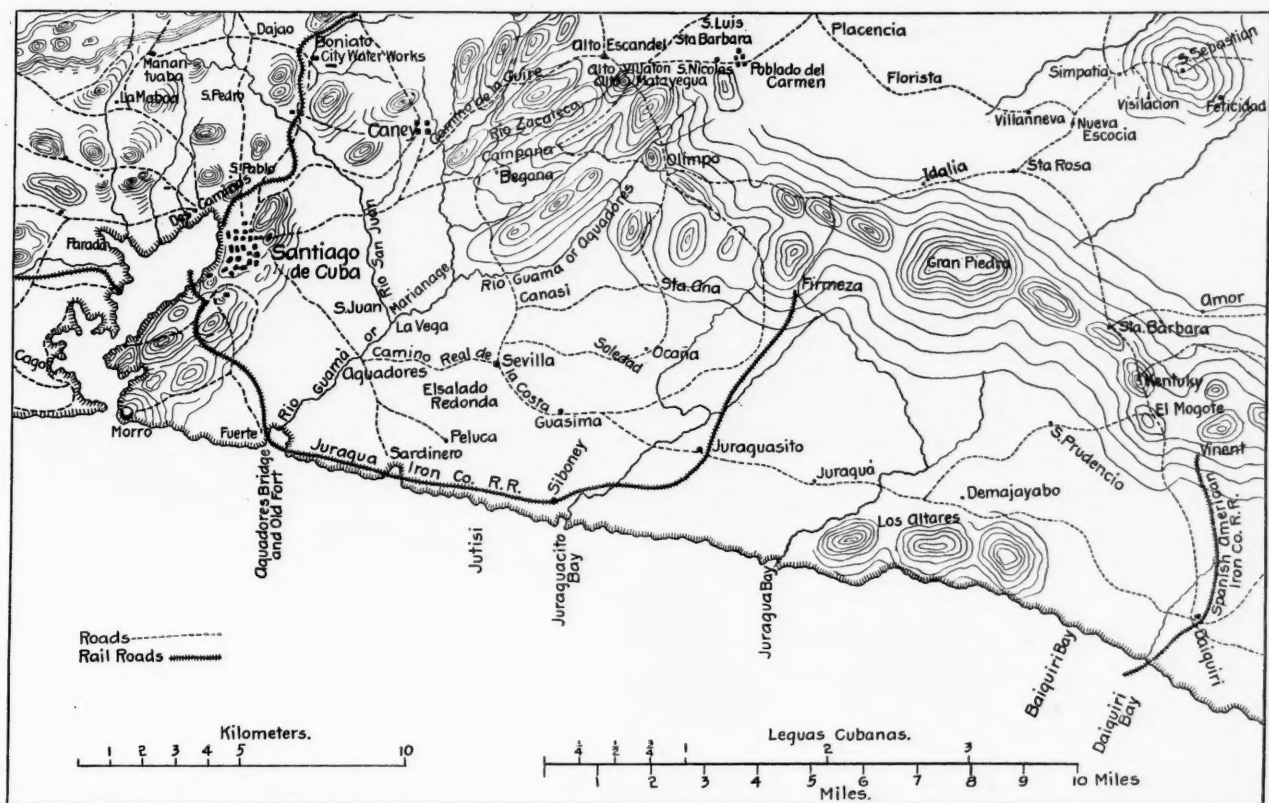
Mr. Waitt—Some weeks ago our chief engineer wanted me to take a trip to a certain point on our road and see why cars loaded with 50,000 or 60,000 pounds of coal, and started, would not continue down a grade of forty-five feet to the mile, and on straight track, too. I spent a forenoon in running loaded cars around curves and on to this grade, and starting them down with a bar. Some of them went all the way down, and others only part way. The ap-

tion of the load transmitted through the side bearings is very large; I think it would be safe to say, probably, as great as is transmitted through the center plates, that depending a great deal on the original distance between the side bearings when the car is new, and also on the stiffness of the bolsters.

If it is attempted to carry the load entirely on the center plate, with large capacity cars, we are necessarily putting a very great strain upon the truck bolsters. It seems a reasonable conclusion, provided a side bearing can be so devised as to make the friction between the body and the truck side bearing practically nothing, or very small, that the ideal way of transmitting the load, considering the service of the truck bolster as well as the freedom in the swiveling of the truck, is to have the load divided between the side bearings and the center plates. It will not do to carry the load on the ordinary center plate, and then have the ordinary cast iron, or malleable iron, or steel side bearings in contact; the friction is too great, and after awhile, after the side bearings get rusty and the cars get somewhat out of shape and sagged more or less, the friction will be too great, as was the case with the cars I have examined.

Mr. Robert Miller—I would like to ask Mr. Waitt if, in his tests with the cars, there were rigid bolsters in the trucks, or whether they were in the form of swing bolsters?

Mr. Waitt—They were all rigid.



Railroads in the Vicinity of Santiago de Cuba.

specifications, so as not to trammel the purchasing agent, that he may buy wherever it is to the interest of the road to buy.

Mr. Forsyth's motion was carried.

Railroads in the Vicinity of Santiago de Cuba.

As a supplement to the map of Cuba which was published on page 490 of our last issue, we give herewith a sketch, on a larger scale, of the territory in the immediate vicinity of Santiago, showing the Juraguá Iron Company's railroad to the eastward, which was mentioned in the preceding article, and including the territory as far as Daiquiri. This sketch is made from a print kindly sent to us by Mr. Josiah Monroe, Secretary of the Juraguá Iron Co. of Philadelphia, and from the contour lines one can get some idea of the topography of the country through which our soldiers advanced. It was at Daiquiri, the terminus of the railroad belonging to the Spanish-American Iron Co., that General Shafter's expedition landed on June 22. The Spanish-American Iron Co. is an American concern with office at 26 Broadway, New York City, James B. Colgate, Colgate Hoyt and John D. Rockefeller being among the principal stockholders. The company's ore dock, extending some distance out from the shore and on which the soldiers landed, is already familiar to American readers from the pictures in the illustrated newspapers. The newspaper statements have generally given the name of the place of landing as Baiquiri, but, as will be seen, there are two places with similar names, and, according to the map, Daiquiri is the one at which the pier is situated.

proach to the sloping track was a curve, and we found that on all the older cars, especially those that had trussed wooden bolsters instead of metal bolsters, for some reason or other the trucks would not straighten out after they had passed the curve; the flanges of the wheel pressed hard against the rail. You can at once see that under such circumstances, even after the cars were started with a bar, or were given quite a push with the locomotive, the friction between the car and the rail would be very great. There happened to be a rainstorm at this time, and the rail was somewhat slippery, which gave the cars all the advantage possible; yet we found car after car on which the trucks would not straighten out on the straight track. Later there were tried cars having metal bolsters, and the side bearings of which were in contact as well as the center plate, and yet those cars curved easily enough and went down on the straight track very readily.

The same condition must exist when we are hauling cars, loaded or empty, over the road, especially so when they are loaded. I think it is reasonable to suppose that we are expending a great amount of power trying to haul cars which, after they have gone around a curve, will not allow the trucks to adjust themselves properly to run on a tangent line.

Then came the question as to how a condition of that kind could be overcome. The first thing that would suggest itself would be to get the car up off the side bearings, and I examined car after car in going through the yard to see what condition they were in, and I think it safe to say that 999 cars out of every 1,000 are transmitting the load from the body bolster to the truck bolster through both center plates and side bearing. On many of the cars the propor-

Mr. Miller—I think I may say that I stand almost alone in advocating swing bolster trucks for freight cars. I have always believed, and do believe, that if there is any advantage in using a swing bolster on a passenger car, there is a greater advantage in using the swing bolster on a heavy freight car. I think 90 per cent. of the cars of the United States have rigid centers for their trucks; I do not favor the rigid center truck. I have given this matter of side bearings a great deal of thought. There have been roller side bearings—a single roller with a trunnion; my observation has been that such bearings wear flat on top, and then they are worse than the ordinary side bearings. I have experimented with roller side bearings, and we are now experimenting with one which we think is correct in principle, and I believe that something of that kind will have to be adopted. Roller bearings must be made in such a way that the rollers must roll. In designing our latest one, which we have now under most of our passenger cars, and which can be seen under our coaches at the Twelfth street depot, we used an intermediate bearing, the cone-shaped rollers working between the bottom and the upper plate, centering to the center plate. A lever compels this intermediate plate to move, and thus compels the roller to move, and the roller then does not wear flat. I have had such side bearings on a passenger coach for six years, and I think that the principle is correct.

President Delano—Two cases have come to my attention of serious loss on account of too much friction between cars and the side bearings of the trucks. The first is in line of great damage to track and rail. In the case of a bridge across the Mississippi River the bridge itself is on a tangent for more than half a

mile, but the approaches on each side are on a curve. It has been found that the rail on what would be the continuation of the outside of the curve is worn twice as rapidly as the other rail. The only explanation is that the trucks become slewed by the curve and do not straighten out when they reach the tangent.

The second instance illustrates the resistance to traction. Cases of switch engines stalling with a very small number of cars going around curves have frequently come to my attention. One case was so absurd as to seem almost untrue, which I saw myself only a week ago. A four-wheel switch engine, which I have seen handle forty loaded cars on a straight line, stalled with a full head of steam, pulling eight foreign box cars loaded with grain, coming out of an ordinary switch lead in a yard. I found that the cars were all overloaded, but not more than 10 per cent. beyond their capacity; but the whole trouble was that they were bearing down hard on their side bearings, the gage of the wheels on the axles was at the extreme limit, and the wheels were grinding so on the track that it was just like pulling the cars up hill to pull them around the curve.

Although Mr. Waitt makes the point that the weight of the cars should be divided equally between the center and side bearings, it certainly seems that if that is done, and so large a proportion of the weight of the cars is to be carried on the side bearings, then at least we must have a better side bearing than is now usual.

Mr. A. E. Manchester—The ideal place to carry a car on the truck is at the center, with the side bearings only performing the office that they are intended for—that is, to take the sway of the car; and we should strengthen our body bolsters and our truck bolsters. It is not impossible that a durable side bearing that will meet these conditions can be designed, but I doubt whether anything has yet been devised that will stand the test of durability and cheapness and do the work. I believe that it is possible to build body bolsters and truck bolsters of such capacity that such side bearings will not be necessary. I furthermore believe that the condition mentioned by Mr. Waitt does not exist to the same extent with swing bolster trucks as it does with the rigid trucks; also that the swing bolster is easier on the body of the car, and, as a result, the car will last longer, will be racked less, and will be in general

design cars so that they will not bear on the side bearings, and yet are, in fact, unable to secure the desired result. In effect, therefore, the theory is one thing and the practical results quite another. I believe the theory is right, and that practice should be wrought up to the requirements. To support a car on side bearings means unknown stresses at every point of support.

Our Trade with Japan in 1897.

A recent number of the British Diplomatic and Consular Reports, abstracts of which have been sent out by the Bureau of Statistics at Washington, contains a report from A. H. Lay, Assistant Japanese Secretary at the British Legation in Tokio. The report discusses the foreign trade of Japan during the year 1897, and after showing that Great Britain's imports into Japan increased in 1897 by about 5 per cent. and that those from Germany amounted to only 8 per cent. of the total instead of 10 per cent., as in the previous year, says: "The United States has acquired a very largely increased share of both the import and export trade, the values of her imports and exports having risen no less than 57 and 55 per cent. respectively." Rails have been imported very largely. Great Britain's share is decreasing, while that of other countries, excepting France, is increasing, and as recent large contracts have been obtained, mostly by the United States, it is probable that 1898 will see a still less proportion of this trade in the hands of British makers. It has always been alleged that American manufacturers or the suppliers lost money over these rail contracts, but, judging by their persistent bidding for the business, this would not appear to be correct. Pig iron imported amounted to 3,570 tons more than in 1896, and prices have increased to a large extent owing to heavier freights. In pig iron the United States appears for the first time, being credited with a value of \$30,650 as against \$415,355 worth from Great Britain. So far the shipments have been experimental, but it is understood that large quantities will arrive monthly in future, shipped in combination with cotton cargoes from Pensacola. Nails from the United States have practically driven out of the market those from Germany and Belgium, but insufficiency of packing has caused much loss on wire nails shipped overland by way of Pacific ports. Quick deliveries made by American firms are referred to and an instance is cited

was 80 per cent., but in some recent cases it has actually reached 90 per cent. The early horizontal engines required about 25 cu. ft. of town gas per I. H. P. per hour, and 31 to 32 cu. ft. per brake horse power per hour. A recent test of a 14-H. P. nominal engine showed that, with good Manchester gas estimated to give 700 B. T. U's. per cubic foot, the consumption was 536 cu. ft. per hour. The engine developed 42.8 I. H. P. and 38.62 B. H. P., so that the gas consumption was 12.52 cu. ft. per I. H. P. and 13.88 cu. ft. per B. H. P. per hour. Single cylinder engines are now made of 140-H. P., double cylinder engines (single acting), 220 I. H. P. Mr. Dowson states that in one installation at Blackpool the aggregate power of engines working regularly is about 940 I. H. P. He further points out that the cost of running a 20-H. P. engine exceeds that of a steam engine of the same power under the usual working conditions. Tests were reported by the author showing that in the trials on Oct. 26 last the anthracite coal consumed per I. H. P. per hour was .846, and on the following day the tests showed .942 for the coal consumption.

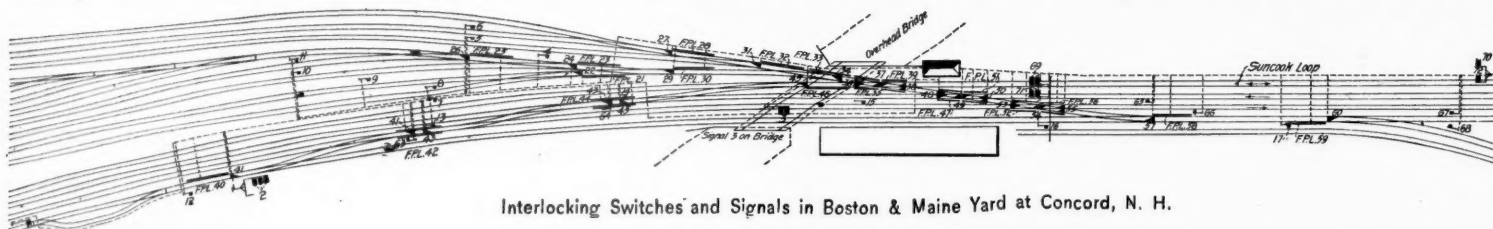
In the conclusions reference is made to the repairs and maintenance of a gas plant and a comparison of such with that of a steam boiler with the same power. The cost of all repairs, as far as the writer has been able to determine for steam boilers, is approximately as follows: For 100 I. H. P. plant, about \$20 a year; 200 I. H. P. plant, \$30 a year; 300 I. H. P. plant, about \$40 a year, and a 500 I. H. P. plant, about \$70 a year.

Among the plants to which the author refers which are at present in successful operation in England the following are the most important:

At Leicester the Midland Railway Co. has four Crossley engines, each of about 50 B. H. P., and two of about 25 B. H. P. each, worked with Dowson gas, for electric lighting. Mr. Langdon, the company's chief electrical engineer, stated that for the second half of 1895 the total fuel consumed (including stand-by losses, etc.) averaged 4.6 lbs. per Board of Trade unit generated; that for the first half of 1896 it was 3.66 lbs., and that for the first half of 1897 it was reduced to 3.02 lbs.

At Halifax Messrs. Whiteley & Co. of the Brunswick mills have two Crossley engines of 60 B. H. P. each, driven with Dowson gas, for producing the current required for about 80 arc lights and about 300 incandescent lamps, as well as for about 45 H. P. in motors used for various purposes.

Last autumn the Tees-side Engineering Works be-



Interlocking Switches and Signals in Boston & Maine Yard at Concord, N. H.

better condition after years of service than were the rigid truck used.

Secretary Whyte—I want to say a word in favor of supporting the car on center plates rather than on side bearings. A number of years ago a certain road took the trouble to oil the center plates of its freight cars. The road was known as rather a crooked road, to be sure, but an effort was made to keep the cars off the side bearings and to further assist the trucks to assume their normal position readily the center plates were oiled, the car inspectors being provided with oil cans having spouts long enough to reach the center plates.

Mr. Waitt—There is one difficulty in making bolsters stiffer for the increased loads that are being put upon the cars, and that is that we are limited in the height of the couplers, and we are limited as to the height of the floor frame of the cars above the trucks to suit platforms and places where cars are unloaded. If we transmit the load through the center plate and the side bearings, we are not compelled to have as stiff a body bolster, and many of the old ones that we have in service would be sufficiently strong if, instead of concentrating the load in the center, we divided it between three points. We get a more ideal way of loading by equally distributing the load.

President Delano—Do you know whether it is the practice among roads with turntables to make the bearings of the turntables at the ends, or is it the practice, as I presume it is, to have all turntables bear entirely on the center, and have the ends free?

Mr. Waitt—I think the tables bear entirely on the center, with the ends free. For one reason, if for no other, that there is plenty of opportunity to provide sufficient depth to get the required strength.

Secretary Whyte—I think one of the difficulties of Mr. Waitt's proposition is that it would be rather hard to distribute the weight over six points. The weight can be distributed on two bearing surfaces, or on three, if the three bear the proper relation to each other, but it is difficult, without suitable equalizing arrangements, to distribute the weight over more than three bearing surfaces and insure that each gets its proper proportion; the bolsters would not be sufficiently flexible to insure this, I think.

Prof. Goss—It seems to me we are attempting to

where English locomotive builders required two years for the delivery of an extensive order, while the Baldwin Locomotive Works turned them out at the rate of two a day and shipped the whole quantity within eight or ten weeks. Another case recently occurred where the English time for shipment of five locomotives was ten months and the price about \$12,000 gold delivered in Japan, and American makers offered to ship in fourteen weeks at about \$8,000 gold. The same specifications were submitted to both countries. The time allowed for execution of orders by the Japanese buyer is always short, and the tendency is to make it shorter still. Consequently, prompt shipments are a great advantage, and when, in addition, the shortness of the rail and sea route via the Pacific coast is taken into consideration, it is apparent that the British maker must, even on the same terms as to price, offer strong counter inducements to insure successful competition. The total imports from the United States and Great Britain in 1890, 1895, 1896 and 1897 are shown as follows:

	From the United States.	From Great Britain.
1890	\$6,574,531	\$26,619,102
1895	9,276,360	45,172,110
1896	16,373,419	59,251,780
1897	27,030,537	65,466,266

The United States exported to Japan locomotives to the value of \$48,588 in 1890; \$416,106 in 1896, and \$2,393,385 in 1897; rails and railroad materials, \$619 in 1890; \$434,853 in 1896, and \$1,558,794 in 1897; machinery and instruments, \$394,111 in 1890; \$781,510 in 1896, and \$1,909,723 in 1897.

Gas Engines in Great Britain and Germany.

At the last meeting of the Federated Institution of Mining Engineers Mr. J. E. Dowson gave some figures relating to the use of gas engines. Up to the end of 1897 about 61,370 Otto engines had been sold by the German and English makers, representing a total of 508,025 B. H. P.; that is, an average for each engine of nearly 8.3 H. P. The number of gas engines made in Great Britain has been 48 per cent. more than in Germany, but the average horse power per engine has been 45 per cent. greater in Great Britain, so that the wide variation of the average output per engine shows that the demands are different in the two countries. Formerly the mechanical efficiency

gan to work two Crossley engines of 60 B. H. P. each and a Dowson gas plant. The managing director, Mr. Walter G. Wood, has just written that at first the fuel consumption was rather high, owing to difficulties fully accounted for, but that in a trial from Feb. 28 to March 15, 1898, they worked 18,240 H. P. hours and consumed 0.66 lb. per I. H. P. (exclusive of the small quantity of coal used in the little boiler). Each engine drives a dynamo, and Mr. Wood remarks: "We are working much of our machinery by electricity, and also lighting our works, the results of which we are not yet able to give, but we think there is no doubt whatever that so far as applied in the shipyards it is proving more economical than steam."

Interlocking at Concord, N. H.

The National Switch & Signal Co., of Easton, Pa., has lately built a large interlocking plant for the Boston & Maine at Concord, N. H., the arrangement of which is shown in the accompanying drawing. As shown in the plan, the plant does not appear to be particularly large, but there are no less than 65 active levers in the machine, and the locking is very extensive and complete. There are 21 levers for working 27 switches and 3 movable point frogs; 19 levers for 33 facing point locks and 27 levers for 32 signals.

The length of the locking bars used in this machine aggregates 993 ft. and the number of locking dogs is 422, including 147 special.

The Apprentice Boy.

As an appendix to the M. M. Association report on the apprentice boy, Mr. Joughins (of the Committee) wrote a special letter on scientific education. Extracts from that letter follow:

Letter by Mr. G. R. Joughins.

It is my conviction that the question of a scientific education is the most important part of our work. I will confine myself to that aspect of the subject. I am particularly interested in it, because I have taught the apprentice boy in science schools for many years, and my experience of the benefits resulting therefrom have been most satisfactory, both to the pupil and the railroad company.

My experience has altogether been in favor of educating our boys, not expecting that they will all attain responsible positions, but because even those who are dull will become better workmen, and the few who possess real ability will be separated from

the ordinary mechanic and given an opportunity to rise above their surroundings and do better work in the world. If only for the sake of these few and for the good work which they will do in our profession and for our country, we ought to put forth every effort to make it easier to obtain a scientific education, and by largely increasing the number of schools make it more universal than at present. The importance of educating our apprentices cannot be overrated. It is of national importance, the prosperity of our nation largely depends upon it, because educated workmen are the backbone of a manufacturing country, such as ours.

I do not agree with those members of the Association who suggest that each apprentice should pay the full cost of instruction, and that he should depend on his own efforts for an education. That principle is not applied to the education of any one else, no matter what school, college or university he may attend, or what profession he may adopt. I believe it to be absolutely necessary to assist apprentices, and to assist them very substantially, both in school fees and in books. Various ways can be taken to raise money to help them, without making it a serious burden upon the railroad companies; it is done at the present time in some places, and could be done in all.

Having persuaded our members and the roads they represent to raise the funds necessary, the Association ought to map out a plan of education. Then at the end of the session examinations should be held at the different schools, using the same examination papers. In this way a system of certificates of acquirements could be issued on a uniform standard, and which would prove of incalculable value both to the employer and employee.

Intimately related to the school question is the establishment of a technical library, which, no matter how small the beginning, could be gradually built up.

The Association should also find out what scholarships for mechanics, mathematics, etc., are given in each state or college for which our apprentices might compete, and publish them, special stress being laid upon the existing Master Mechanics' scholarship at Stevens Institute.

The proposed science schools would not, of course, be confined exclusively to locomotive railroad apprentices. Apprentices from other shops who wished to join should be heartily welcomed on an equitable financial basis. Other organizations might wish to join in the plan of education, and should be encouraged to do so, but in the meantime the Master Mechanics' Association should go forward in the good work, and we, as its committee, should find out what ought to be done, what the railroad companies are willing to do, and make the best recommendations within our power to further the highest interests of the apprentice, which no doubt lie in the direction of a scientific education side by side with careful training in the workshop.

Discussion by Mr. Wagner.

I have not anything to say on the report proper, but on the appendix, a letter by Mr. G. R. Joughins. I have read this, and most heartily indorse what the author has said concerning the value of night schools. I feel more than ever impressed with the necessity of organizing night schools for young mechanics, which will work into the hands of our technical schools. I believe from my own experience that there will be no difficulty in raising funds for the maintenance of night schools of this kind in a community where mechanics and apprentices are employed. I had the pleasure of being instrumental in starting such a school some six years ago which is now producing gratifying results. Several of the pupils have passed the entrance examinations of a technical society with practically no other preparation except that received at the night schools. We have a night school which started from just such a suggestion as is given in the appendix with a fund of \$120, and we are now spending \$1,500 a year, and are charging the pupils \$5 a year, having school three nights a week, giving courses in mechanical engineering and mining engineering.

The Johnson Door for Hopper-Bottom Cars.

The accompanying engravings show the Johnson hopper-bottom door and fastenings for use with coal and ore cars. A full size model of this arrangement was exhibited at the Saratoga conventions by McCord & Co., which firm controls the patents. This exhibition attracted much attention and was very favorably commented upon.

Fig. 1 shows the door in the open position, and Fig. 2 the operation of closing, while Fig. 3 shows the door closed. The doors are in all respects the same as those commonly used, the new features being the hangers and operating levers. Instead of being hinged to the hopper, the doors are suspended from it by straps at either end. The straps are pivoted on the hopper irons, thus insuring a tight fit when closed, which may not be the case when the doors are hung from the side sills or similar portions of the car body.

As seen, the two doors are connected on either side by a pair of toggle levers of different lengths. The

shorter arms are each fastened to one of the doors by brackets, while the longer arms are forged in one piece with a transverse shaft, which runs beneath the bottom of the other door. The arrangement of the levers being the same, it is possible to open or close the doors from either side.

In order to close the doors, the operator grasps the hand hold and raises the levers to the position shown in Fig. 2, from which point he pushes them forward beyond the dead centre, folding the two levers one upon the other. When closed the levers are car-

kinds of weather. As the results of these tests, the following claims are made: The doors are locked automatically, and when closed are held tight against the bottom of the hopper and sagging is prevented; all the attachments are out of the way of the load in discharging; a long leverage is provided in releasing the doors; when open the doors are but little nearer the track than when in the closed position, and for this reason the width of the hopper opening may be increased beyond the limits of present practice. No change is required in the construction of the car to admit of the use of this door.

Car Cleaning.

In our issue of May 27, page 371, appeared an abstract of a paper by Mr. F. T. Slack, Motive Power Department, New York Central Railroad, on the subject of car cleaning. This paper, and the discussion before the New York Railroad Club, now appear in the May proceedings of that club. We give below a few extracts from the discussion. The reader who cares to follow this matter of the use of formaldehyde a little further is referred to the Railroad Gazette of July 16, Nov. 26, Dec. 10, 1897, pages 510, 820, 872.

Mr. Appleyard (New York, New Haven & Hartford.)

—The traveling public ought to be prevailed upon to do their share toward keeping the cars clean. We all know the condition in which a smoking car, for example, is found at the end of its trip. It is simply vile. The dirt and expectoration gets in behind the heating pipes where it is next to impossible to reach it. There are many conditions which make it quite impossible to have railway cars in an ideal condition, and I think the whole question is one which ought to be pressed before our railroad officials more strongly than ever before, with a view to having the best facilities which the conditions on the various roads will warrant.

Mr. H. B. Hodges (Purchasing Agent, Long Island R. R.)—The question of removal of dirt is really a scientific one. It is well known that there are various kinds of dirt; some can be dissolved by one class of solvents and some by another. For instance, oil, which serves really to cement the dirt to the cars, is not dissolved by water. To dissolve oil or grease the solvent is something in the nature of benzene or light petroleum. There is a compound on the market, the name of which I will not mention, as I suppose it is contrary to the rules of the club to advertise any particular compound, although I have no interest in it. This compound was found, in my investigation, really to effect wonders. My attention was directed to the fine appearance of the Chesapeake & Ohio cars, and we investigated the matter pretty thoroughly and found that they used a compound which is really nothing more than water and mineral oil and a small amount of very fine tripoli and a very little soap. The oil which is used cuts the grease. The water dissolves that portion of the dirt which is soluble in water, and the tripoli has an abrasive action and rubs off what can only be removed by mechanical means. The Chesapeake & Ohio cars are cleaned very freely and thoroughly by this process and by using this material. We experimented with some of this material, and I will say here that we imitated it and made something like it ourselves, and with equal success. I have not mentioned all the ingredients. One or two ingredients were added to give lustre after the work was done. We would take cars that looked as if they ought to be scraped, and by using this material and another important adjunct—elbow grease—we succeeded in converting old cars into new ones—a modern case of Aladdin's lamp.

The use of acids, which I notice is referred to by Mr. Slack, seems to me a little inadvisable in the hands of the average car cleaner. Of course, an intelligent man could use it and immediately flush it off so that no trace of it would be left on the varnish, but there are objections, I think, to using anything so positive as an acid. Of course, acid is very useful in cleaning car windows where whitening is being used which is soluble in the acid, which will immediately dissolve it where a solution of oil and water would not have that effect.

I notice that Mr. Slack raises an objection to the use of kerosene oil or petroleum on trucks on account of its leaving the surface afterwards in a stick condition, so that the dust readily adheres. Of course that is true, but I still think that it is an admirable solvent for greasy surfaces.

I notice also reference to hair brushes. I looked into that matter rather carefully from the standpoint of the purchasing agent—which I am now—and I find that it is more economical in the long run to buy bristle brushes and not hair brushes. The hair mats up, and the bristles, although they cost much more in the beginning, are more economical in the long run. They do better work from the beginning and last longer, and a poor brush is a very poor investment because the wood splits and the hairs come out.

I did a good deal of work in connection with the Surgeon General at Washington, Dr. Wyman, with formalin, or formaldehyde—as it has several names. Formalin is the greatest disinfectant ever discovered and so powerful that it is very economical. One part in several thousand parts of water is a

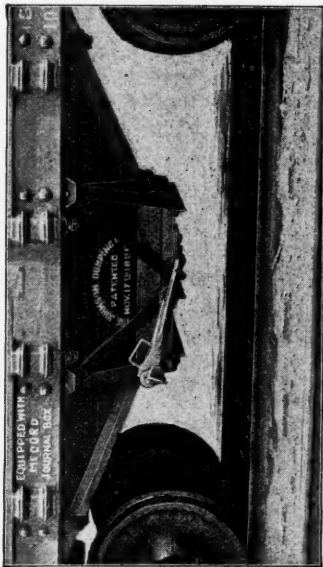


Fig. 3.

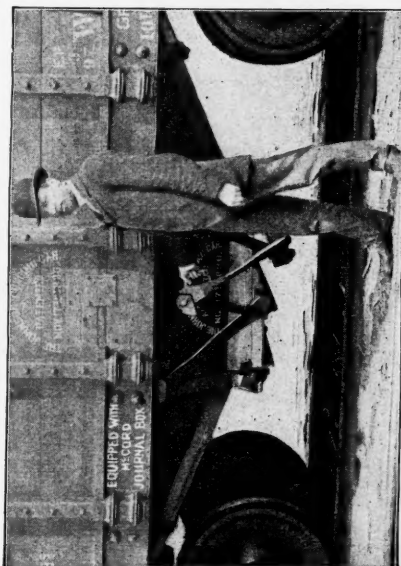
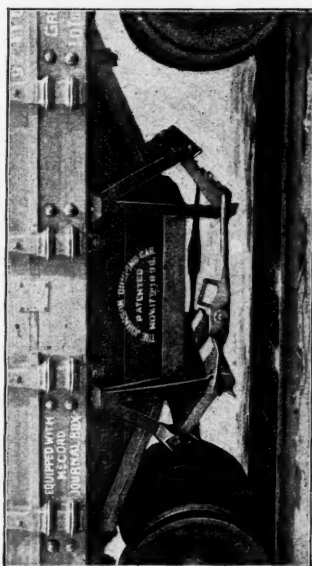
Fig. 2.
The Johnson Door for Hopper-Bottom Cars.

Fig. 1.

ried on brackets, one on either side of the car, which are placed on the outer edge of the hopper. The load on the doors puts the short lever under compression and the long lever in tension, so that there is always a tendency toward further rotation of the levers under the action of the load, which is resisted by the brackets mentioned above. In opening the doors the operator raises the levers above the dead centre, from which point the load acts to cause the doors to swing downward and backward out of the way. Single doors can be fitted with similar attachments.

The device shown has been in service for the past 16 months, and has worked satisfactorily in all

solution of sufficient strength to destroy all germs of disease, and it has the property which most other disinfectants do not have, of destroying the odor as well as destroying the germs. There are other disinfectants that do one thing without doing the other, but formaldehyde does both. This treatment also entirely purified the water closets in this particular case. The closets were very offensive before, and absolutely without odor after it. This is a medium of disinfection that can be used very easily and inexpensively, and all roads, especially those that carry immigrants or passengers going to health resorts, would do well to try it. We were interested because we carried on the Southern road a great many consumptive patients, and, of course, as is well known consumption is a particularly contagious disease, especially through the saliva or sputum.

In the directions quoted by Mr. Slack he speaks of the use of calcium chloride mixed with the formaldehyde solution. The object is to raise the boiling point. It has been found that this formaldehyde operates more thoroughly when dry, besides not dampening the contents of the car, and consequently Dr. Kinyoun very ingeniously added to the solution of formaldehyde the calcium chloride to raise the boiling point of the mixture considerably above the boiling point of water, so that the gas could be driven off without generating steam. I believe he found he could use a 33 per cent. solution of chloride of calcium without converting the water into vapor. That is to say, no aqueous vapor was formed.

The way to tell whether the gas has traveled through the car is to put the boiler containing formaline and calcium chloride at one end of the car and pass a small copper tube through the key-hole, start the burner and the fumes will soon enter the car. Then go to the other end of the car and apply your nose to the key-hole, and after a while you will experience a very stifling odor, though not a disagreeable one, and then you know that the car has been filled with this vapor. I do not suppose that it would be interesting to go into any further technicalities, although I think we have here at hand one of the most valuable discoveries of recent years, which in the easiest way possible can be used to destroy the germs of disease without affecting in any way the most delicate silk fabric or woodwork. This formalin, I think, ultimately will be made on a very large scale and sold probably very cheaply. At present it is quite expensive. A pound costs, I think, about 60 cents. But one pound can be diluted to 2,000 pounds of water, and can be applied as a spray.

There is one more point, if I may tax the patience of the club a few minutes longer. I also have discovered that there is a substance sold under various names, as carbolem, phenoleum, etc., a coal tar product, a disinfectant that also has a cleansing effect. Now it seems that this phenoleum will remove the stains from marble in the wash rooms. It seems to have not exactly a detergent effect, but nevertheless it does remove stains and deposits. Now as long as it will do the work of acid with no injurious effects, I think it would be well to call the attention of the club to it. The kind I have found best is known as "Gunst's phenoleum."

Mr. M. N. Forney.—People should be educated about what I might call the abomination of expectation. It is peculiarly an American vice, and it exists everywhere, and especially in railroad cars. If anything can be done by the railroads to educate the public from this vicious practice it will be a great point gained. I remember seeing that in Belfast, Ireland, they had stuck up in all the street cars the following notice:

"The habit of spitting in a public conveyance is a filthy one and renders the person so offending subject to the loathing of his fellow passengers."

I think if the railroads here would put that up in all their cars it would do a little to bring the public to an appreciation of what an abomination this is.

There is another matter in regard to the construction of cars. It seems to me that car builders do not give enough attention to keeping the floor space in the cars entirely clear of unnecessary obstructions, so that there would be no places for the lodgment of any sort of dirt or uncleanness.

There is one particular thing in cars that is very injurious and totally unnecessary, and that is what are called "U" bends in the steam pipes under the seats. They seem to be particularly unnecessary, and if they were kept out and movable foot rests substituted for them, it would be much more acceptable, and all the inaccessible corners involved in this arrangement would be avoided. If these regulations were observed, with the use of our friend "formaldehyde," I think we would get the best of the bacilli in our cars.

New Designs for Electric Mining Locomotives.

The Baldwin Locomotive Works and the Westinghouse Electric & Manufacturing Co. have issued a catalogue descriptive of a new design of electric mining locomotives, made by Mr. George Gibbs, for different gage tracks and varying in width from 24 to 56½ ins. There are in all seven different classes of locomotives of this type, weighing from 7,000 to 34,000 lbs., the smallest developing, under full load at

a speed of eight miles an hour, 20, and the largest 150 H. P. The smallest class has 24-in. wheels, a 44-in. wheel base, while the over-all dimensions are: Width, 41 in.; length, 10 ft. 4 in.; and height above rails, 33 in. The largest size has four 36-in. wheels, a 60-in. wheel base, and is 74 in. wide over-all, 13 ft. 6 in. long, and 42 in. high above rails.

The frames are outside the wheels and consist of heavy cast-iron side and end pieces, securely bolted together and kept square by machine joints and shoulders accurately fitted. The pedestal caps and forgings, and the entire machine with electrical apparatus, is supported on helical springs placed over the journal boxes. Each axle is driven by a 4-pole, steel-clad motor, and the reducing gear is inclosed in a tight case and runs in oil. The operating machinery is reached, for inspection or repairs, through doors in the planking laid on top of the frames. A platform is provided at one end for the motorman and all levers are within his reach without leaving the seat from which he controls the locomotive. These machines are quite compact, and are believed to embody many improvements over previous designs.

A New Locomotive Feed Water Strainer.

A new locomotive feed water strainer, designed and made by William Sellers & Co., Inc., of Philadelphia, has a number of advantages to recommend its use. The general arrangement is compact, and the total distance between couplings is so short that it can be placed between the suction pipe and the hose without any alterations. The straining plate is of heavy copper, 7½ in. by 5 in., with straining holes ⅛ in. diameter; more than half of the holes can be stopped up without reducing the capacity of the injector.

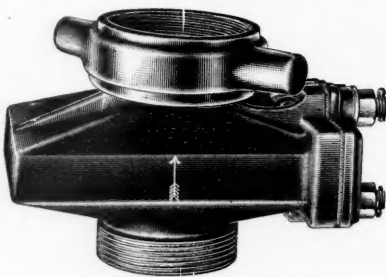


Fig. 1.—Sellers Feed Water Strainer.

An outside view of the device is given in Fig. 1. The hose and pipe connections are those adopted by the leading railroads, and the application of the strainer is therefore a very simple operation. The body is substantially made, heavily ribbed on the outside, and provided with grooved ways extending diagonally across the interior on both sides, which hold the copper straining plate in place. The large hand hole at bottom is for the purpose of cleaning and for the removal of the plate; it is closed by a heavy cap, held in place by a fixed stud and a swinging T head bolt. The simplicity of this method of fastening permits the easy removal of the straining plate. The diagonal position of the straining plate forms a large chamber at the bottom for the accumulation of material which has been stopped, without interfering with the direct passage of the water. The nuts, bolts, cap and gasket are so attached that no part can be entirely removed from its place, so that the strainer can be cleaned without the possibility of loss of any of the essential pieces.

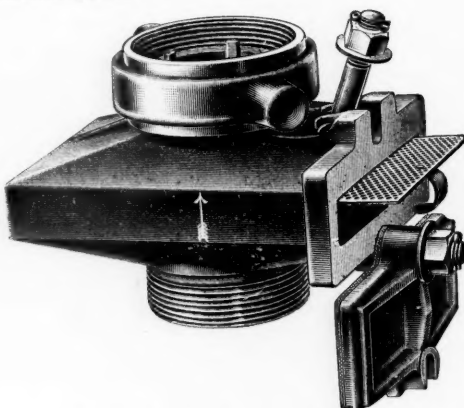


Fig. 2.—Strainer Ready for Cleaning.

Fig. 2 shows the strainer ready for cleaning; the lower nuts have been slackened, the T head bolt at the front swung clear, and the cap and gasket rotated on the fixed stud, exposing the hand hole. The straining plate is then withdrawn and cleaned and the accumulated dirt in the trap removed. The whole operation takes less than half a minute and is accomplished without breaking any of the pipe joints. The large size of the straining plate renders frequent cleaning unnecessary, and, under average conditions, these strainers have run more than a week without reducing the capacity of the injector or requiring attention. Records of service tests show this device to be well designed and of much practical value. It is substantially made and has no parts to wear out. It

is believed to be more effective than either the tank or hose strainer, as it removes from the supply water the particles which are liable to pass through strainers, reducing the life of both the injector tubes and the seats of main check valves.

Classification of Thesis Work in Electrical Engineering.

At the last meeting of the American Institute of Electrical Engineers the retiring President, Dr. A. E. Kennelly, suggested that the Institute take steps to classify and publish the thesis work in electricity undertaken in the various colleges throughout the country year by year. The following committee was appointed to report on the advisability of taking up this work: Prof. W. E. Goldsborough, Prof. R. B. Owens, Dr. H. T. Eddy, Mr. B. J. Arnold and the President, ex-officio. In stating the advisability of such classification the President said:

Although a large amount of electrical work is done in physical laboratories in the United States, a comparatively small amount of the results of this work becomes available to the science or art of electrical engineering. Each year sees more than 100 students engaged in experimental thesis work after a laborious training and preparation for several years in the technical college. Many of these men have the time and facilities to do the best experimental work of their lives under the guidance of their instructors. Some of the men display aptitude and interest in some special line of research in which they would be best left untrammelled, but in most cases the experimental work under co-operative guidance could accomplish a great deal for the knowledge and progress of our branch of applied science. There are numerous questions concerning the various electro-magnetic properties of matter and of the ether that are of great and growing importance, and there are numerous scientific subjects of immediate practical importance that it is necessary to measure and observe, so that by uniting the available experimental resources of the various colleges in this country under a common leadership, in sympathy with the college instructors, the results which now largely fill thesis books lying on neglected shelves might be incorporated into permanent results for the general advancement of our profession. The plan would involve practically no expenditure beyond the voluntary efforts of those upon whom the duty devolved of formulating and dividing the subjects of research and classifying or comparing the results attained. Such a system of co-operation among the students, through their instructors, would economize a large amount of the most skilled technical labor, and accelerate progress in all branches of inquiry, application and industry.

While this suggestion, if carried out, may be of use to some investigators, there is danger of its leading to incorrect deductions. As a result of the experience of those who have conducted thesis work in a number of technical schools we are led to believe that the value of such work is seldom sufficiently accurate to form the basis for deducing scientific laws. While our inquiries have been made with respect to graduating thesis work in mechanical engineering, the same doubtless applies equally well to similar work in the electrical engineering courses. Most of the work of this kind is of necessity pushed through in a very limited time, and unless it receives very careful supervision by some competent instructor the work, from a scientific standpoint, is practically valueless. Besides, there is a great danger of taking from the student that freedom of investigation which he feels when the work is not considered of great importance and where he is left free for himself to solve the many difficulties which are sure to be encountered. Moreover, if such a classification should be made and the work published many deductions might be made on the ground that all the work was sufficiently accurate to warrant the reader in forming conclusions. If the purpose of this plan is to disseminate general electrical knowledge, it is commendable; but if it is primarily for the purpose of securing data for establishing new laws or building up the theoretical side of the subject the plan should be discouraged.

The Present Status of Electrical Engineering.

Dr. A. E. Kennelly, in his retiring address as President of the American Institute of Electrical Engineers, delivered at Omaha last week, gave some interesting figures showing the development of electrical science in the last 14 years. Some of these figures may well be quoted. In 1884 a 50 KW. dynamo was considered a large machine, but at present the largest generator built, or building, is of 4,600 KW. capacity. The price of dynamos in 1882 was about 20 cents per watt output, while dynamos of similar running speed now cost about 2 cents per watt. The efficiencies of continuous current dynamos have not made any marked advance since the Philadelphia Exposition in 1884, when the efficiency was approximately 92 per cent., but at that time only 6 watts per pound of net weight was the average for the output. This figure has been increased until a similar rating to-day would give about 10 watts per pound.

The cost of generating a KW. hour of electric energy from steam for electric lighting in 1884 was at least 7½ cents, while at the present time in large street railroad power stations a KW. hour is generated for 1 cent, and in some cases this amount is even considerably less. The price of a 16 C. P. incandescent lamp 16 years ago was about \$1; now it is about 18 cents; while with arc lamps little improvement has been made since 1884. It is estimated that about 600 million dollars has been invested up to the present time in electric lighting plants in the United States.

The best storage cells tested in 1884 gave a yield

under laboratory conditions of 3.4 watt hours per pound of electros with an energy efficiency of 69 per cent. when tested at the mean current density of 12 amperes per square foot of negative plate surface. At present a yield of from 5 to 6 watt hours per pound of charged cell may be expected with an energy efficiency of 85 per cent. when discharged at a current density of 4.8 amperes per square foot of negative plate surface.

The introduction of soft cast steel for electric motors has enabled its output to be increased from 5 watts per pound of net weight to about 14 watts per pound in street railroad motors. There are about 14,000 miles of electric railroads now worked in the United States, with a nominal capital of about a billion dollars, and employing about 170,000 men.

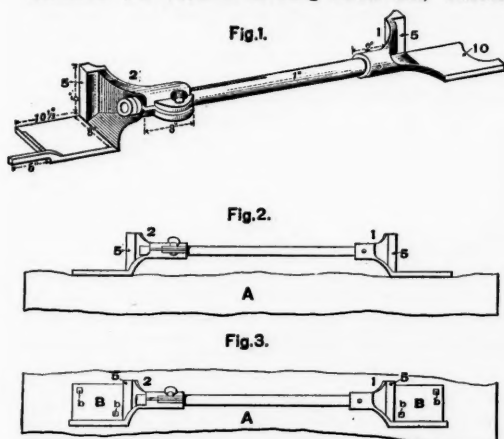
Owing to the recent successful employment of high voltages and multiphase alternating currents the power of falling waters has been utilized quite recently, and it is estimated that about 150,000 KW. of this class of machinery is installed in North America and transmitting power to various distances up to 85 miles and at various pressures up to 30,000 volts.

Dr. Kennelly also brought out the growing favor with which alternating current induction motors have been used in this country in recent years. This has been due largely to the powerful starting torque and the absence of commutators in these machines. The alternating current transformer has been developed so that an efficiency of 98½ per cent. can be obtained. The author of the paper states some of the improvements in telegraph and telephone instruments, and in regard to the former states that "wireless telegraphy has entered its experimental stage and bids fair to enter practical service in the future, at least within a reasonable range."

The electro-technical theory has made considerable advance, especially in the study of alternating currents. Dr. Kennelly suggests in this connection that the Institute classify and publish the thesis work of the various colleges throughout the country for the purpose of furthering such investigation. Further comments on this point will be found in another part of this issue.

Ware's Tie Plate Surfer.

There is now in use on the Buffalo, Rochester & Pittsburgh a convenient instrument for facilitating the work of fastening tie plates to sleepers, the invention of Mr. Henry Ware, roadmaster for the company named. The appearance of this instrument, called a surfer and gage, is shown in Fig. 1, and its use is further explained by Figs. 2 and 3. By placing it on a tie, as in Fig. 3, the exact place for fixing the plates can be quickly marked out. The heads, 1 and 2, can be adjusted to any desired gage and to plates of any dimensions. The straight edge, 5, forms a square with the inner face of the surface, B, so that the instrument when one-quarter turned over furnishes a guide for quickly laying the plate accurately in position and holding it there while embedding the projections in the tie. Plates can be thus attached to the ties before they are put into the track, the gage making it easy for one man to do this work alone. The surfer can be used to facilitate the work of leveling hewn ties, whether



Ware's Tie-Plate Gage and Surfer.

plates are to be used or not. This work can be done at any time before ties are used, thus economizing labor. Leveling ties before they are put in the track aids the track layer in detecting rails which are inclined to "roll out."

Mr. Ware says that from his own experience he finds that with this device perfect work can be done at one-quarter the cost of any other method of embedding the tie plates.

To apply plates to ties already in the track one of the heads of the instrument has a concave end, 10, Fig. 1, to fit against the rail on one side of the track. The gage being adjusted, the position for the plate on the opposite side can be quickly marked.

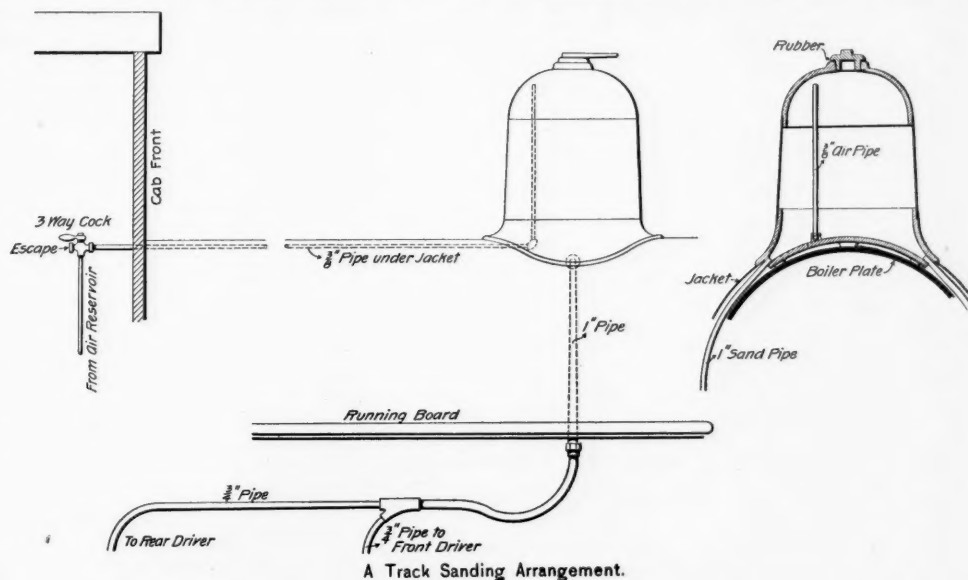
Mr. Ware uses a heavy beetle of special design for embedding plates in ties, and says that, when properly driven, sand and foreign substances cannot get between the plate and the tie. The plate being thus fixed, it will never buckle.

Mr. Ware's address is Springville, Erie Co., N. Y.

Track Sanding Arrangement.

In view of the fact that many of the patented track sanding devices for locomotives have proved themselves unreliable and costly to keep in good working order, a new design is illustrated herewith which is exceedingly simple, and, as it does not contain any delicate working parts, there is no possibility of its disarrangement. It is perhaps not correct to call it a new design, as it is merely an application to a locomotive of the pneumatic sand-lifting arrangement described in the Railroad Gazette of Sept. 25th, 1896, at present in use by several leading railroads.

The idea embodied in the design is merely to admit air pressure on top of the sand in an air-tight reservoir or sand box, forcing the sand out through pipes leading from the bottom of the sand box to any desired point. It is not essential to have the sand box on top of the boiler, as gravity is not depended upon for delivering the sand; a reservoir containing the sand can be placed under the cab floor or at any



other point convenient for filling. It is necessary, however, that the reservoir should be air-tight, but as sand boxes ordinarily are made so, in order to keep out moisture, the device may be applied to any sand box in good order without other changes than arranging the lid so as to facilitate its closing up tight in a prompt manner, either by an interrupted thread, as indicated in the cut, or by bolts or some other means. Whatever method is selected, a rubber gasket should be used to make the joint, so that any grains of sand between the surface in contact will imbed themselves in the rubber and allow the surfaces to come together tight.

The special sand box base shown in the illustration is also unnecessary, although it is advantageous, for it allows all the sand in the box to be used, which the flat-bottom bases at present in general use will not do.

Other parts consist of a three-way cock in the cab, communicating with the atmosphere, and with either an independent auxiliary reservoir or with the regular main reservoir. From this cock runs a ¾-in. pipe to the top of the sand box, this pipe being preferably placed under the lagging so as to re-heat the air. By operating this cock the engine-man can admit air at the bottom, or he can relieve the pressure inside the box by exhausting it through the same cock.

The delivery pipes running from the box may be bent in any form to clear driving brakes, etc., and may be run either to the front drivers alone or to all pairs, but it is essential that the pipe, before running down to the track, is bent up so that the sand must be forced upward a little, otherwise the shaking of the engine may overcome the resistance due to the angle of repose of the sand, and make it leak out by itself when not needed. This bend in the pipe is below the running board, and the sand which has passed the bend will continue to flow and be wasted even after the air pressure in the sand box has been withdrawn.

This sand box can also be connected up with the brake system so as to automatically sand the track by exhaust air when the brakes are applied.

If the sand box is placed on top of the boiler, as shown, it requires very little air to operate it, because the sand will run down by gravity and the only work done by the air is to push it over the bend and through the horizontal portion of the pipe.

The device is not patented, and if those who have not met with success in trying other sanding arrangements should wish to try this, they are at perfect liberty to do so.

Freight Carting in London and New York.

The wastes and delays connected with trucking freight in New York city are the subject of a long article in the Journal of Commerce by Stephen T.

Williams. The capacity of the freight stations of New York city is so limited that every afternoon large numbers of trucks have to stand in line waiting their turn to deliver freight to be sent out the same night. Large numbers of these teams have to wait from one to four hours, and often longer than this. It is stated that if a shipper sends extra men with his wagon, in order to save time in handling heavy goods, he is coerced into hiring laborers waiting around the freight houses. These laborers succeed in having the merchant's incoming freight delayed, goods being placed in an inconvenient situation in the freight house. Of the large numbers of the trucks which wait in the streets every afternoon it is noticed that a large proportion, probably three-fourths, are more than one-half empty, and Mr. Williams evidently believes that there ought to be a consolidation of the trucking service, so that more nearly full loads can be carried. From the experience of the express companies here, and of railroads in England, it is believed that such a consolidation would be de-

cidedly profitable, and it would certainly relieve much congestion in the streets. One of the chief obstacles to this plan is believed to be the profit which many shippers now make by charging consignees a fat price for delivery of goods to freight houses. This practice of wholesalers is being restricted, however, by sharp competition, especially in the dry goods trade; it is said that many merchants in this line now sell goods f. o. b., and even in many cases delivered at destination.

Mr. Williams goes on to enlarge upon the advantages of the collection and delivery system as in vogue throughout England. Free delivery by railroads is already in force at a few places in this country, of which the Baltimore and New York stations of the Baltimore & Ohio Railroad are mentioned. In Montreal, Toronto and other places in Canada the complete English method is in operation.

The strength of the English arrangement lies in the fact that the railroads can do the trucking at a rate less than it can be done by any private carrier. The highest charge in London is 6 to 7 cents per cwt. and the average 4 cents. Grocers in New York frequently pay 10 to 15 cents per 100 lbs. for extra trucking. The ability to compute beforehand the cost of transportation through from shipper to consignee is regarded by Englishmen as a great convenience. Collection and delivery are not always by horse and wagon. In London the railroads collect and deliver much freight by barges and lighters on the river, the territorial limits including 30 miles of water front on each side of the river. The conditions are similar at Liverpool and Birmingham. At the latter place the extensive canals of the Birmingham Navigation Company are used.

The objection that the English railroad truckmen are too slow is claimed to be without foundation. By the use of the telephone "hurry" orders can be given, as well as where private truckmen are employed. In London the Great Northern Railway has 28 receiving offices for freight, the Great Western has 35 and others corresponding numbers. These receiving freight houses are cleared four or five times a day, and much oftener in the busy center of the city. Large shippers have no difficulty in reaching an understanding with the railroads as to convenient hours for the collection and delivery of freight.

In a report on railroad cartage in England, which was made at the International Railroad Congress in 1895, it was held that this department improved the railroad freight service generally, because it led to competition in facilities rather than in rates. Officers of English roads say that only by keeping the trucking in their own hands can they do their business in the limited space available in their London stations. In some cases it was affirmed that if consignees and consignors carted their own goods the freight-house and freight-yard space would have to be doubled.



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EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.

The exports of locomotives continue to grow in value. On June 17 (page 437) we tabulated the figures for a number of years. There it was shown that for the fiscal year to June 30, 1897, the value of locomotives exported was \$3,225,831. The tables for the first eleven months of the year, which closed June 30, 1898, are now available, and it appears that the value of locomotives exported was \$3,429,665. In the same eleven months of 1897 it was \$3,059,348. The gain was over 12 per cent. The increase in 1897 over 1896 was a little over 28 per cent.

Some wonderfully interesting matters will be brought to the attention of engineers, naval architects and naval officers by the detailed reports on the effects of gun fire on the Spanish ships that have been sunk in the two fleet engagements. Some of these matters are suggested in the very brief abstract which the newspaper correspondents have sent of the expert report on the condition of the Spanish ships off Santiago. One obvious recommendation is that the least possible amount of wood should be used in warships. Another is that ships should not carry torpedoes. In fact, there is a pretty widespread suspicion that the torpedo as a weapon of attack is a demonstrated failure, and that the torpedo boat and torpedo boat destroyer have been respected far beyond their merits. We should not be surprised if this war results in developing artillery in the direction of quick fire rather than great caliber, but the very meagre notes from the report which have come to us give little information as to the performance of the 12 in. and 13 in. guns of our ships.

We have spoken elsewhere of the admirable report of Mr. Bush on "Thermal Tests for Car Wheels." Another report which attracted even more attention was that of Mr. Waitt on "Specifications for Air Brake Hose." Mr. Waitt made a thorough exploration of a field which is almost new, so far as the associations are concerned, and yet the subject is one of immense importance. The yearly cost of renewals of air brake hose is a serious addition to maintenance expenses. In the topical discussion on this subject last year Mr. Rhodes said that renewals of air brake hose on 7,000 cars of the Chicago, Burlington & Quincy cost annually about \$12,000. If all the freight cars of the country which could reasonably be fitted with air brakes were maintained at the same average rate for this one item it would aggregate something like \$2,000,000. This, however, is only a small part of the cost of hose failures. We have no clew to the cost of accidents and delays due to defective hose. The bursting of hose is one of the serious causes of collisions and break-in-two accidents. It would be useless labor to try to make a guess at the number or money value of such accidents. Anyone can make his own estimate from his own knowledge and experience, and if anyone does make such an estimate we should like to be allowed to print it. But we happen to

have a convenient figure bearing on this matter. Some years ago we made occasionally an analysis of the continuous brake blue books published in Great Britain every half year, giving very complete records of brake failures. We found that of all detentions to traffic due to the failure of the Westinghouse air brake to act properly about 70 per cent. were from burst hose. This will suggest something of the possible cost of this element. While the direct cost of renewal of defective hose is a considerable item in yearly expense, the indirect cost must amount to a much greater figure. Yet Mr. Waitt says "no attention whatever has been given to the subject by 90 per cent. of our companies." He examined 26 sample hose received for test. These were of eight different makes, "and undoubtedly of greatly varying prices." They ranged from first class down to the grade of garden hose, made largely of reclaimed rubber. Only four of the makers had furnished hose which would meet the requirements of the specifications of the Lake Shore, the Erie, and the Baltimore & Ohio. We shall not repeat here any of Mr. Waitt's findings or recommendations. Some of them we have already published; but we recommend his report to careful reading. Those who read it with care will know a good deal more about air brake hose when they get through than they knew when they began.

Heat Tests for Car Wheels.

In the small group of really fine reports at this year's conventions we must give a high place to the report of Mr. Bush on Thermal Tests for Car Wheels. It is carefully reasoned out, from known facts, clearly stated, and is on a subject of great practical interest. We printed this report nearly in full June 17, page 428.

The report was received with no discussion, but it stands on the records as a minute of argument and information for the use of those who may follow the subject further. That it must be followed further there seems to be no reasonable doubt. So far as we can judge now the heat test is the only one practicable and available which will tell whether or not cast iron wheels will live under the brake. So far as we can judge, that test will become one of the ordinary and permanent requirements of the Master Car Builders' Association. In the existing state of the art nothing else presents itself to offer security against a class of wheel breakages which is numerous and dangerous.

The objections raised to the heat test are: First, that it is too severe; and, second, that the life of the wheel would be shortened if the wheel mixture were such as to endure the thermal test.

With regard to the first objection, Mr. Bush replies that most manufacturers have no difficulty in making wheels to stand this test at a small increase in cost. Further, he points out that the fundamental principle of specifications is to prove ability to stand not only ordinary conditions, but extraordinary conditions, with a fair factor of safety. So far as we can ascertain (and we have watched the matter somewhat closely), the wheel makers have generally ceased to object to the severity of this test.

Reply to the second objection is a large part of Mr. Bush's report. He has been unable to get figures which sustain this objection. Wheels made to stand the heat test have not been used long enough in considerable numbers to make possible any demonstration from actual service either way, but probably within a year or so there will be a good amount of testimony from observed facts. Meantime, Mr. Bush makes an admirable argument from the facts of the chemistry of cast iron.

The life of a wheel (breakages apart) is in the chill, but the effect of chilling is to produce great uniformity in the carbon distribution. The results of the analyses of 20 wheels are given. These wheels were taken out of service, and they were the product of several of the principal makers of the country. They were all subjected to the heat test, 10 passing it successfully and 10 failing. Chemical analyses were made of all of these wheels, the gray iron and the chilled iron being analyzed separately. In the report the complete analysis of the gray iron is given for each wheel, and the carbon content of the chilled iron is given for each wheel. Below we average these figures, the averages being sufficient for our purposes:

Carbon in Gray Iron—20 Wheels.		
	Graphitic Carbon.	Combined Carbon.
Ten wheels, stood test.....	2.912	0.745
Ten wheels, did not stand test..	2.481	1.102
Carbon in Chilled Iron—the same 20 Wheels.		
	Graphitic Carbon.	Combined Carbon.
Ten wheels, stood test.....	0.42	3.39
Ten wheels, did not stand test....	0.42	3.31

From these analyses Mr. Bush draws the conclusion that there is no evidence in the chemical composition to show that the chills of wheels which stand the heat test differ from the chills of wheels which do not stand that test, so far as their properties depend upon the chemistry of the metal. Further, he concludes that wheels made in the different parts of the country and by different makers do not differ widely, so far as the chemical composition of the chills is concerned. It is obvious that this should be so, since the chill fixes the chemical composition within very narrow limits. So far, then, as the wear of the wheel depends on the chill, the use of a metal which will stand the heat test does not seem likely to shorten the life of the wheel.

As we have given in the tabulation above only the averages of the 20 wheels, we summarize below the ranges in carbon content of the wheels of various classes:

	Gray Iron.	Graphitic Carbon.	Combined Carbon.
Stood test.....	2.41 to 3.48	0.02 to 1.24	0.67 to 1.34
Did not stand test	1.98 to 2.94	0.02 to 1.24	0.67 to 1.34
	Chilled Iron.	Graphitic Carbon.	Combined Carbon.
Stood test	0.30 to 0.55	3.15 to 3.71	0.67 to 1.34
Did not stand test.....	0.29 to 0.78	2.97 to 3.56	0.67 to 1.34

A Point in Corporation Law—The Kinderhook & Hudson Case.

The decision of Mr. Justice Daly of the New York Supreme Court in declining to interfere with the present status of the reorganization of the Kinderhook & Hudson Railway, as requested by the majority of the stockholders and bondholders, presents a curious phase that sometimes confronts reorganization committees and one that evidently was not contemplated at the outset by the parties concerned. The question involved is interesting, though the issue is narrow.

The case turned upon the construction to be given to the reorganization agreement, and was brought principally to determine whether the majority of the stockholders and bondholders should control the road, notwithstanding the period fixed by the reorganization agreement for the control of the road by the committee has not yet elapsed. The death of two out of the nine gentlemen who comprised the Reorganization Committee and the sale by five of the remaining members of all their interest in the road to outside parties who constitute a minority of stockholders and bondholders, leaving but two of the committee really interested in the road, brought up the question whether there was in existence a committee authorized to act according to the intent of the reorganization agreement. The agreement does not expressly provide for the exact status now existing, and what are the rights of the respective parties under the agreement is, therefore a question of construction.

The complaining stockholders claimed that the purpose of the agreement was to put the management for the period limited into the hands of those who were largely interested in the road, and keep it there only so long as that interest continued, while the defendants claimed that the powers of the committee survived the transfer of all personal interest in the road. The plaintiff, alleged that the death of two members of the committee, and the transfer of all interest in the road on the part of the five other members, leaving only two members of the committee as originally constituted, worked the dissolution of the body by not leaving a majority of the members competent to act, so that the committee, having come to its death by operation of law, the rights formerly residing in it return to the beneficiaries of the trust now extinct.

Judge Daly finds that the instrument intended to lodge the control of the road for the time limited in the hands of the committee, irrespective of their interest in the road, and he bases his conclusion chiefly upon two grounds: First, the object of the parties in giving the control of the road for the period limited was to keep it under one management during that time, to insure its prosperity by a uniform policy; and secondly, the policy pursued had been eminently successful, as the road was admitted to be in a prosperous condition.

We must confess, however, that we are not quite prepared to acquiesce in the soundness of Judge Daly's decision. The reasons given by him are forcible enough, so far as they go, but there are other considerations of general policy and of particular application in this case which do not appear to have received the attention from the learned justice that their importance deserves. We think the agreement is quite susceptible of the construction, not only that the parties in interest intended to keep the management under one control, so that a uniform policy would be pursued during the period stated, but also, and especially, that that control should be in the hands of those who were most interested in the road. The second reason assigned by Judge Daly—the prosperity of the road while in the hands of the committee—does not sufficiently cover the objection of the complaining parties, which is addressed to a future status that may be reasonably apprehended and not merely to the past or present status. The past and present prosperity of the road may be accounted for

In a very large degree, if not entirely, by the very great personal pecuniary interest that the committee had in that prosperity, and if the moving cause ceases to exist by the transfer of that interest it may be apprehended that these gentlemen will not in the future manifest the same concern or bring to bear the same capacity or behalf of the road that they have in the past.

It is suggested by the plaintiffs in their case that the transfer of interest of the five members of the committee was coupled with an agreement to exercise their powers as members of the committee in the interest of the parties to whom they sold out, who constitute a minority of stockholders. This may or may not be true—we have no information on the subject to form an opinion. Undoubtedly such an agreement, if made, would have been a consideration of great value to the purchasers of the stock, for which they could have afforded to appreciate the price. Such an agreement need not be expressed, and may not be susceptible of easy proof, and yet it may be made in such cases and may be carried out without detection.

The policy of all States which have made much progress in the development of corporation law is quite uniform, to the effect that the control of a corporation shall be vested in those who beneficially own it. It has been quite frequently held in well considered cases, for example, that the voting power of stock shall not be separated from the beneficial ownership except under conditions carefully limited and recognized as judicious. A contrary policy has been found to put corporations under the control of those whose interest requires its extinction, and to place the power of disposing of the business of one into the hands of his competitor without the owner's consent or even his knowledge.

We do not, of course, mean any reflection upon any gentleman connected with the case under consideration—we are considering it merely from the larger standpoint of policy.

We think, therefore, that it would be more consonant with the general principles of corporation law and with real progress in cases of reorganization, if the decision in this case had gone the other way and the court had held that the purposes of the reorganization having been accomplished as far as now legally possible, the property should be restored to the management of those who own it. This is the natural tendency of all good law, and a departure from such policy is only to be justified by the best of reasons, under the plea of necessity in peculiar circumstances. The case will probably be appealed, and in that event we may expect a fuller discussion on perhaps broader lines. At any rate, the decision is a distinct contribution to the law of reorganization, and will, no doubt, play its part in the future.

Electric and Other Bell Cords in England.

A committee, one of the members of which is Major Gen. Hutchinson, has made a report to the British Board of Trade, recommending a law to require "an efficient means of communication" between passengers, trainmen and engineers on all railroad trains. At present the English law simply requires a means of communication on trains which run more than 20 miles without stopping. This leaves many cars without any equipment whatever, and on others the cord, strung along outside the carriages, is the only communication in use. The Board of Trade withdrew its approval of the cord in 1873, but it appears that it has not insisted on anything better, although according to the law all appliances of this kind must be approved by the Board. Electric appliances are in use to a considerable extent. The present committee made extensive inquiries, and, besides the recommendation just noted, reports two conclusions: (1) that the outside cord is inefficient and the inside cord satisfactory, and (2) that although electric appliances are efficient, no one of those in use so far excels the others as to enable the committee to recommend it for general adoption. The committee prefers, however, a device in experimental use on the Great Eastern. In this apparatus wires are carried along the brake pipes and the coupling of the pipes between two cars automatically gives the necessary connection between the wires.

The committee examined all the principal devices now in use in England and made inquiries in other countries. In England the trains of the London, Brighton & South Coast are all fitted with Stroudley & Rusbridge's electric communication, which was approved by the Board of Trade in 1887; the South-Eastern has almost all its trains equipped with Walker's apparatus, approved in 1869, and the London, Chatham & Dover uses Varley's on some express trains. With Varley's apparatus two wires are used, necessitating two couplings, while in the others one coupling only is required. Certain other roads have electrical communication on a few trains. On the Great Central road and some others a partial application of the automatic vacuum brake is used to communicate between different cars of a train. The passenger, in moving a handle inside the carriage, opens a valve and displays a disk outside his compartment. This arrangement was approved by the Board of Trade in 1893.

In Austria all fast trains have Rayl's electrical communication. In Hungary corridor cars are nearly universal and passengers can apply the automatic brake; the introduction of automatic brakes has led to the abandonment of electrical apparatus formerly employed. In Belgium, where the Westinghouse brake is used, it can be applied by a passenger, and this is deemed a sufficient means of communication; the size of the valve has been enlarged so as to insure the speedy stoppage of the train. Some of the railroads in France use Prudhomme's electrical apparatus, while others deem the Westinghouse brake a sufficient safety appliance for passengers' use. In Germany, Russia and Switzerland automatic brakes are in general use and passengers can apply them in an emergency. The Indian Government has tried various electrical apparatuses, one of which, that invented by G. K. Winter, has been in use on the Madras Railway since 1880 and is approved. Many English railroad companies strongly object to giving passengers control over power brakes, therefore the committee does not believe that any company should be compelled to use a device giving such control, against the advice of its responsible officers.

The gist of the report seems to be simply that the 20-mile limit ought to be removed, so that the Board of Trade can require communicating apparatus on all passenger trains. The Board's view as to what is not an efficient means of communication is already sufficiently apparent from its withdrawal, 25 years ago, of its earlier approval of the common bell cord. How it is that numerous companies continue, in spite of the law, to use this, and nothing better, does not appear.

One of the most significant paragraphs in the report is that in which it is stated that in Hungary the adoption of automatic brakes led to the abandonment of electric communication. As far as safety is concerned the opinion that such exclusive dependence on the brake will answer all practical requirements has undoubtedly obtained to some extent in this country. A few weeks ago we noted that on a prominent Western road the passenger trainmen had been ordered to use the conductor's valve instead of the whistle signal whenever it should be necessary to stop a train in the shortest possible time. For convenience, however—that is, for ordinary signaling to the engineers—the whistle signal, operated by air pressure through a line of pipe like the Westinghouse brake—is now practically universal on passenger trains throughout the United States. We mention this fact for the benefit of our English readers, for the report before us states that the committee "received no information from the United States or from New South Wales." In view of the extensive use of the Westinghouse brake in Great Britain this is a curious omission from an ostensibly thorough report.

The executive officers of the railroads west of Chicago have reorganized their Freight Association once more. After numerous conferences they have agreed upon an organization quite similar to that recently adopted by the Southwestern roads at St. Louis. In this, as in the St. Louis agreement, there is ample evidence of the best possible spirit, and if words will do the business, rates will be reformed at once. The Commissioners are to do all in their power to stop rate cutting, legal or illegal, and fines are prescribed for wrong doing. But the old weaknesses are all present, and the only comment that seems appropriate at the present time is, wait and see. The new committee will have plenty of opportunity to show its usefulness, as freight rates in that territory are far from stable. It is rumored with persistency that the Western roads are to try again the "physical division" scheme; in other words, attempt to agree upon a percentage of the freight business to which each is entitled and adjust the "overs" and "shorts" by diversions, under direction of the Commissioners. It does not seem to us very important whether this report is true or not. These same lines have tried the scheme before, when they had a stronger agreement than the one just adopted; the Southwestern lines also tried it; and in every instance it has been a complete fizzle. At the present time a clause in the agreement providing for anything so nearly like a pool would be sure to defeat the whole agreement; while a "confidential" understanding outside of the written agreement would rightfully expose the participants to ridicule. If diversion of shipments is right and lawful, or is believed to be so free from injustice that the railroads are willing to fight in the courts to have it declared lawful, it had better be provided for in the articles of association; but to provide for it outside those articles is a confession of unlawfulness at the outset.

The Commissioner of Internal Revenue has decided that where Government officers or agents send goods by express the express company must be required to give a bill of lading with a stamp affixed. This decision is embodied in a letter to the collector at New York City, and it says that it is the duty of the carrier to affix the stamp to the bill of lading and also to the duplicate. The inference is drawn that if the companies must affix the stamps when the Govern-

ment is the shipper they will be required to do the same for individual customers. A correspondent of the Philadelphia Press, who has interviewed members of the Congressional committee which drafted the law, says that it is the unanimous opinion of these Congressmen that the decision of the Commissioner in the case of the express companies agrees with the views and intentions of Congress. As to telegrams, however, it is said that the intention of the framers of the law was that the sender should pay for the stamp. The reason for thus exempting the revenues of the telegraph companies from a tax which the railroad and express companies are not exempt from is not apparent, but it is reported from Washington that the Commissioner has issued an opinion which agrees with the view of Congress, as here reported. It is said that suits against the express companies have been begun at Chicago and Kansas City, as well as at New York.

NEW PUBLICATIONS.

The Locomotive Link Motion. By Frederick A. Halsey, Associate Editor American Machinist. Octavo, cloth, 31 pages, 46 engravings. New York: Angus Sincclair Co. 1898. Price, \$1.00.

The author says in his preface that this treatise is the result of a study made possible by unusual facilities offered by the Schenectady Locomotive Works. This investigation brought out two unsuspected errors in the link motion and the fact that the effect of the angular vibration of the connecting rod, instead of being a disturbing factor, is in reality a corrective factor. The two errors referred to are those due to the location of the eccentric rod pins back of the link arc, and to the angular vibration of the eccentric rods, which errors, combined with the one due to the connecting rod, give a final or resultant error, which is corrected by locating the saddle stud back of the link arc.

The opening chapter has to do with the applicability of the link motion to locomotives, and the conclusion is reached that the present type of link motion is suitable for the particular conditions of locomotive work, despite the adverse criticisms which have been offered. A chapter is given to an elementary explanation of the plain slide valve, and another to a comparison of the link motion and the shifting eccentric. Examples of the application of the Bilgram diagram to the study of different valve motions are given, but it is not clear why the Bilgram diagram is used in preference to the diagrams of Zeuner. Zeuner's diagrams certainly have the advantage of being more generally understood. An interesting table is then presented of the proportions of representative link motions of various types of locomotives.

The remainder of the book consists largely of the results of the author's original investigation, and the following chapter headings give an idea of the subjects discussed: Area of the Ports; Port Opening and Area of Exhaust Nozzle; Errors of the Link Motion; the Adjustment of the Saddle Stud; the Error Due to the Angular Vibration of the Eccentric Rod; the Error Due to the Location of the Eccentric Rod Pins Back of the Link Arc; the Final Offset. The last chapter deals with the results obtained from different valve settings of actual engines and the recent practice of a number of railroads in setting valves.

The explanations are clearly and concisely given, and those who have to do with the mechanical departments of railroads will find this treatise both interesting and instructive. We know of no work in which the locomotive link motion is treated in so comprehensive a manner.

The Technograph, published annually by the Engineering Societies of the University of Illinois, contains a number of articles of interest. In our last issue, p. 499, was given the substance of the article on "Tests of Electric Heaters," taken from the 1898 volume. The article on "A Short Method for Railroad Crossing Computations," by Messrs. L. K. Vial and R. B. Ketchum, gives solutions for the three general cases of crossings: First, the crossing of two tangents; second, crossing of one tangent and one curve, and, third, the crossing of two curves. In the article on "Shearing Strength of Rivet Steel," by Prof. A. N. Talbot are given the results of tests to determine the shearing and tensile strength of rivet material for boilers. Tables are given showing the tensile strength, effect of decreased bearing surface and effect of soft shearing plates. Reports of impact tests of beams are also given, the results of which tend to verify the theoretical laws of resistance of elastic beams to impact, showing among other things that a suddenly applied load produces twice as great a stress as one gradually applied, and also that the coefficient of elasticity within the elastic limit has the same value for impact as for gradually applied loading. Among other articles are "Notes on Sketching," by F. F. Frederick; "Effect of Temperature on Insulation Material," by William Esty; "The Design of Elevating and Conveying Machinery," by J. V. Schaefer; "Corrosion of Iron," by S. W. Parr and A. E. Paul, and "Governor Indicator," by A. H. Neureuther.

Transactions of the Association of Civil Engineers of Cornell University. This volume contains the addresses of non-resident

lecturers, miscellaneous papers, constitution and a list of members of the Association at Cornell. Many important papers are here printed, nearly all of them being of particular interest to mechanical engineers. The illustrations throughout were carefully prepared. Among the topics discussed are the following: "Organization of a Railway Engineering Department," "Experiments Upon the Holding Power of Wood Screws," "Placing Concrete in 90 ft. of Water," "Impact Tests on Wire Rope," "Sub-structures of Tall Buildings," "The Present and Future Prospects of Gas for Lighting, Heating and Power Purposes," and "The Great Hydraulic Laboratory at Cornell."

The Indicator Handbook. Part I. By Charles N. Pickworth, Whitworth Scholar, Editor of the Mechanical World. Cloth, 12 mo., 131 pages, 81 engravings. Manchester and London: Emmott & Co.; New York: D. Van Nostrand Co., 1893. Price three shillings net.

Part I. deals with the construction and application of the indicator, while Part II., which is now in preparation, will treat of indicator diagrams and their analysis.

In the first chapter the principles of the indicator are briefly given; in the second chapter, of 33 pages, are descriptions of different styles of indicators. Then follows a discussion of the errors in the instruments themselves, different methods of attachment, errors due to the connections, various forms of reducing gear and the errors of each. The final chapter is on the use and care of the indicator. This book will be especially useful to young engineers.

American Street Railway Investments. Published by the Street Railway Journal, New York; Street Railway Publishing Co.; pages 279, with 24 maps. Price \$3.

The annual publication of the Supplement to the Street Railway Journal known as the "Street Railway Red Book" has just been issued. This volume is similar to those published for many years, and contains, in addition to what has heretofore appeared in previous issues, comparisons of the gross receipts for 1896 and 1897, arranged so that comparisons for the past four or five years can be made without referring to previous editions. In our issue last week, page 499, was given a summary of the gross receipts of all companies in the United States that took in over \$25,000 last year.

TRADE CATALOGUES.

Boiler Tubing.—A pamphlet descriptive of seamless cold drawn steel tubing for locomotive, marine and stationary boilers, made from solid round bar, has been issued recently by the Shelby Steel Tube Co. of Cleveland, O., and known as Catalogue C. In addition to a description of the process of making seamless steel boiler tubing, some photographic reproductions of samples of cold drawn tubing, showing remarkable ductile properties, together with sample test pieces of hot rolled seamless tubing of large size and heavy wall are shown.

The Phoenix Iron Works Co., Meadville, Pa., sends a small pamphlet containing illustrations and a description of the Moyes water tube boilers as built by the company. A hydraulic riveting machine having a 9 ft. 1 in. gap and capable of exerting a working pressure of 75 tons, has lately been installed and hereafter all boilers will be riveted on this machine.

Railroad Legislation in Massachusetts.

The Massachusetts Legislature, recently adjourned, passed only two or three bills of a general nature affecting transportation interests.

The first railroad bill of importance enacted was that known as the "Boston & Maine" bill, designed to permit that corporation to purchase the stock of lines owned, leased or operated by it, the stock to be held in its treasury, and new stock being issued, the object being to lessen the fixed charges of the road and thus place it in a safer financial position in times of business depression. This bill has already been fully reviewed in the Railroad Gazette.

The most important bill was the "Street Railway Bill," signed by the Governor June 24. This bill was one of two recommended by the special "committee" or commission on the relations of street railway and municipal corporations, C. F. Adams, W. W. Crapo and E. B. Hayes. (See Railroad Gazette, Feb. 25, page 140.) It changes the method of taxation of street railroads and contains other regulations. The franchise tax will be the same as before, but the State Treasury will pay it to the towns in which the railroads lie instead of to the towns where the stockholders reside. It is believed that this change will diminish opposition to the extension of street railroad tracks in some towns. The requirement that in substance one-half of the net earnings above 8 per cent. shall go to the State remains in the bill, although there was an effort to have it cut out. The commutation tax, in lieu of the present local provisions for keeping streets in repair, etc., was considerably discussed and amended. As finally passed the tax is 1 per cent. on roads earning \$4,000 a mile or less. The money from this tax must be used by towns for construction and maintenance of public ways. The section concerning free passengers was

amended to include mail carriers, superintendents of other lines and highway officials of towns. The law takes effect as to the franchise tax, on Oct. 1, but the commutation tax does not go into effect until a year later.

The committee's recommendation of municipal ownership failed to pass the Legislature. The provisions of the bill which was passed seemed to please the street railway companies as a whole. It was felt that it provided something substantial in the way of legislation and would prevent the enactment of laws of a more unfriendly character in the future. Therefore, there was no particular opposition to it as it proceeded, excepting by those who objected that it was too friendly in its character to the corporations, or by others who thought its tax distribution feature too much of a novelty.

A bill which caused much talk was House 1200, which provided that the transfer by mortgage, dated Oct. 26, 1892, to the American Loan & Trust Co. made by the Central Vermont Railroad Co., of the interest of that company as lessee in the New London Northern should be consented to. It was argued that the question of the validity of the mortgage of a lease was pending in the courts, and that if the law had been violated it was ridiculous to pass a law providing that it should not be violated again. However, it was pointed out that the bondholders would suffer if the mortgage was not approved, and after weeks of discussion the bill became a law in May.

The bill permitting the Hudson River & Berkshire to build in Massachusetts was passed last year with a provision that a Massachusetts charter should be applied for this year, and in accordance with this a petition for incorporation was presented. Two hearings were given, but as it did not appear that anything had been done under last year's bill "leave to withdraw" was the verdict.

A bill was presented to provide for free transportation of bicycles, but this also had "leave to withdraw."

Representative Garrity, of Boston, offered a bill to provide that whenever any part of a car or locomotive, or any pin, link, etc., gives way or comes off, etc., such fact shall be deemed prima facie evidence of negligence of the company, but it finally went over to the next Legislature. A bill to compel railroads and street railways to provide drinking water on cars was rejected.

A bill was enacted to provide that in all proceedings for the recovery of damages sustained in the abolition of grade crossings parties recovering damages shall also recover costs, and the court may also make allowance for fees of expert witnesses and for plans and surveys.

A bill was passed to provide that medical examiners shall file a notice within seven days after viewing the body in case of a railroad accident, and that the proper court shall hold an inquest within thirty days, duly notifying the Railroad Commissioners. If the court fails to comply with this provision the Railroad Commissioners shall fix a day for the inquest, giving suitable notices. In case of the repeated failure of the court or justice, the Railroad Commissioners may notify the Governor, who shall remove the offending person from office.

An effort to secure ten hours' work within eleven consecutive hours for railroad employees was defeated, as the employees themselves came to the State House in large numbers and protested against disturbing the present system.

There was another effort in the long-standing project to secure the separation of grade crossings in East Boston. After numerous hearings Samuel Hoar, counsel of the Boston & Albany, drew a bill for the Railroad Committee, which provided that the Boston & Maine, if it chose, might withdraw its business from East Boston Island. The grades were then to be separated, the State to pay 30 per cent., the city of Boston 20 per cent., and the Boston & Albany 50 per cent. of the expense. In the House a section was added providing that the cars of the Boston, Revere Beach & Lynn should be run by electricity through the streets of East Boston, but it was claimed that this would ruin the road, both financially and as a passenger road from Lynn. The bill was finally referred to the next General Court.

The street railway legislation consisted largely, outside of the bill already described, of bills to give local companies rights which they could not obtain under the general laws. In joint session with the Railroad Committee there were hearings on a bill to permit railroads to construct branches to be operated by electricity in public ways, but, believing that the time was hardly ripe for such legislation, the matter was referred to the next General Court. A large number of companies were given the right to carry small parcels and the mails, and to do an express business. The "Lancaster" and "Bay State" petitions for the right to operate elevated roads in Boston were kept alive (until the result of the Boston Elevated Company's plans shall be known) by reference to the next General Court. Several bills intended to make the furnishing of free transfer checks compulsory were adversely reported and rejected.

A bill was enacted permitting street railway companies to use their own tracks for the purpose of hauling snow, ice, stones, gravel and grading ma-

terial. A general bill to authorize street railway companies to act as common carriers was rejected.

On the annual report of the Railroad Commissioners a bill was reported and passed which permits street railway companies to acquire land, not exceeding 50 ft. in width, outside public ways, for the purpose of avoiding or eliminating grade crossings of railroads. No land can be taken which could not lawfully be taken by a railroad.

Steel Permanent Way.*

The life of the best description of iron rails at the time of the invention of the Bessemer process, on some of the most heavily worked portions of the main lines in this country, only averaged about a couple of years, and where the traffic was exceptionally heavy it was measured even by months; the average life, if estimated by the amount of traffic it was capable of enduring, being about 17½ million tons.

Such, however, has been the enormous growth of railway traffic since that time, accompanied as it has been by a corresponding increase in the weight and speed of the engines and trains, that it would admittedly be impossible at the present time to carry on the traffic at all on such heavily worked lines as, for instance, the Metropolitan, District and other intensely worked suburban lines, without the aid of the Bessemer steel rails.

Having regard to the well established fact of the overtaxed condition of the permanent way at the time of the discovery of the Bessemer process, it is impossible not to recognize the remarkable opportuneness of the particular time which witnessed the discovery of a process by which a material has been produced possessing in a high degree all the requisite qualities of strength and durability so much needed to resist the destructive effects of the largely increased traffic even of that day, still more so to meet the requirements of the enormous increase which has since occurred, to which reference has been made; and what is perhaps even more remarkable still is that the illustrious inventor of the Bessemer process was not at that time at all aware, as he has often admitted to the writer of this paper, of the then overtaxed condition of the permanent way, and obviously much less capable of forecasting the far greater demands upon its powers of endurance which the future had in store for it.

The figures in the following table, besides bearing testimony to the remarkable growth of traffic throughout the kingdom during the last 36 years, very strikingly show that since 1874 (the period about which the principal main lines had become relaid with steel rails), in spite of the large increase of traffic, a very marked decrease has occurred in the annual cost per mile of the maintenance and renewal of the permanent way, directly attributable to the road having been relaid with this much more durable material, the slight increase observable in the table during the last few years being mainly due to the increased cost of the reconstruction and maintenance of stations, buildings, bridges, and the increased signaling expenses.

Railroads of England and Wales.

Year.	Miles Open.	Train Miles Per Mile.	Tons. Per Mile.	Roll. Stock Per Mile.	Main. Way & Works Per Mile.
1861.....	7,820	11,197	9,807	22.56	£270
1871.....	10,850	13,587	12,939	23.22	330
1881.....	12,807	16,282	16,201	27.15	412
1891.....	14,156	19,087	18,637	34.85	432
1896.....	24,708	19,937	20,408	37.20	468

Although the growth and intensity of the L. and North-Western traffic has been far greater than the average throughout the kingdom, there has, since 1874, been a large and continued decrease in the expenditure per mile on the permanent way, which, in 1874, attained a maximum of £446 per mile. From that time, however, it decreased to £288 per mile in 1881, and continued to decrease until it reached a minimum of £256 per mile in 1887, the slight increase during the last few years being probably due to the relaying of some of the most heavily worked portions of the line with a much heavier class of rail.

The reduction in the annual cost of maintenance and renewals of the locomotive stock has been equally remarkable, having regard to the very great increase in their power and weight, the expenditure, which in 1861 amounted to as much as £273 per engine, having during the following ten years been reduced to £192 per engine, and during the next decade to £145; the variations in the expenditure per engine since 1881 have been very slight.

Although since 1874 the London & North-Western Company has had 352 more miles to maintain, and the train mileage and tonnage per mile has in the meantime increased 50 per cent. in the one case and 70 per cent. in the other, the amount annually expended on the maintenance of the way is absolutely less at the present time (1897) than it was 23 years ago, the average decrease during that long period being £165,582 annually, the total reduction in the expenditure, as compared with what it was in 1874, amounting to the very large sum of

*Extract from a paper by R. Price-Williams, Esq., read before the Iron and Steel Institute, May, 1898.

£3,008,389; the actual amount, however, of the annual reductions in the cost, taking into account the increased mileage maintained, and the amount of traffic, can only be correctly arrived at by taking the difference in the cost per mile maintained in subsequent years as compared with what it was in 1874, from which it will be seen that the total annual saving to the Company has averaged as much as £248,049, and in the aggregate to £5,705,120.

The amount of the annual reduction in the cost of the maintenance and renewal of the locomotive stock worked out per engine in the same way from 1861, when a maximum of £273 was attained, has become reduced to £158 per engine at the present time, the reductions during the whole period having averaged £224,878 per annum. The aggregate saving resulting from improvements in the construction, labor-saving appliances, and especially from the use of the much more durable and cheaper material, steel, and also from the reduced wear and tear of the machinery attributable to the very much improved condition of the permanent way, has amounted to over eight millions sterling, so that altogether the saving to this Company alone, resulting from the reduced cost of these two items of working expenses, has averaged nearly half a million annually, and in the aggregate to nearly 14 millions sterling during the period in question.

Average Life of Steel Rails.

With the large and varied experience we now have acquired of the material and its behavior in the road, the average life of a steel rail under given conditions of speed and weight of traffic can be very approximately determined by the wear of the rail-head, to a depth that would not imperil its strength, caused by the weight and speed of the traffic which has passed over it.

The results of numerous tests and observations made by the writer and by others show that the average life of a "bull-head" steel rail, possessing all the essential requirements as regards the quality of the material, is about 20 million tons for each $\frac{1}{2}$ of an inch as the safety limit for wear, this $\frac{1}{2}$ of an inch wear of the rail-head, and, allowing would give 120 million tons as the average life of a steel rail, as compared with 17 $\frac{1}{2}$ million tons, the ultimate life in the case of the best description of iron rail; in other words, the average life of the "bull-head" section, under similar conditions of traffic as regards speed and the character of the line, is just about seven times that of an iron rail.

The form and weight of a rail best adapted to meet the requirements of light and heavy traffic has been so thoroughly investigated, both theoretically and practically, by such eminent authorities as Sir Benjamin Baker and others, that it is full time an agreement should be come to for the general adoption of a few standard types.

The attainment of this at the present time is especially desirable, as, owing to the great increase in the speed and weight of the traffic, the renewal of many of the main lines with a much heavier class of rail has now become necessary. At present, however, nearly every railroad not only has its own particular section, but in many cases more than one is in use, and as the variations in the weight and form of the rails on different railroads are, as a rule, very slight, the adoption of standard types for light and heavy traffic lines could be easily arranged.

Among the most noticeable improvements in the permanent way which have contributed to this large and continued reduction in the cost of maintenance may be mentioned the heavier class of rails used, the increased weight of the chairs, plates, and shoes, the bearing surface of the chairs on the sleepers (so as to distribute the weight and destructive effects of the passage of the train loads) and the increased size of the sleepers; and what perhaps as much as anything has conduced to the present improved condition of the permanent way has been the strengthening of the road bed by the substitution of the much heavier and more durable broken stone or clinker ballast.

Professor Arnold's investigations, as given in his most valuable paper on "The Physical Influence of Elements of Iron," read at the Institute in 1894, would appear to confirm the later American experience, inasmuch as the results of a series of tests made by him with one of Wicksteed's machines show that, with a much higher percentage of 1.35 of carbon, the elastic and the ultimate tensile stresses were as much as 46.53 tons and 57.50 tons per square inch respectively, as compared with 22.45 tons and 26.80 tons in the case of steel with an alloy of 1.51 per cent. of nickel and 28.98 tons (elastic and ultimate tensile stress) of steel containing 1.36 per cent. of phosphorus; and further, that under a crushing or compressive weight of 100 tons per square inch, with samples of steel containing the same high percentage of carbon, the compression was only 33 per cent., as compared with 57 per cent. in the case of the steel containing 1.51 per cent. of nickel. The compression, however, under similar weights and conditions of a sample containing as much as 1.36 per cent. of phosphorus was only 26.1 per cent.

The results of some tests made by the writer at

Kirkaldy's, with samples of steel manufactured from Tasmanian chrome iron ore, show that with about 0.52 per cent. of chromium, the steel combines in a remarkable degree what is essential in the case of steel rails, viz., great tensile strength, ductility and hardness; the ascertained elastic limit and ultimate tensile strength being respectively 28.5 and 54.3 tons per square inch, whereas the maximum elastic and ultimate tensile strengths obtained in the case of a number of Bessemer steel rails tested by the writer at Kirkaldy's were respectively 26.37 tons and 46.87 tons. The great resistance to compressive or thrusting stress exhibited by these samples of chrome steel, viz., 55 tons per square inch, was even more remarkable when compared with the 29.45 tons in the case of the Bessemer steel rails referred to.

The effect of chromium in hardening steel has long been recognized, and as far back as 1877 Mr. Edward Riley, in a paper read at the Institute, drew special attention to this important characteristic, and Mr. Brustlein, of Unieux, France, in his paper in 1886 on "Chrome Iron and Steel," establishes the fact that the presence of chromium in steel increases its tenacity, as well as in enabling it to offer considerably greater resistance to compression. He further showed that, under the hammer, it behaves quite as well as ordinary carbon steel, and, speaking generally, says, "It has a less hardening tendency than manganese or highly carbonized steel, that it imparts more tenacity, and further, that the tendency to crystallize by the excess of heat is not so great."

The results of the tests made by Professor Arnold, given in the paper already referred to, are confirmations of this, and show besides that, both as regards tensile strength and resistance to compression, steel containing 1.10 per cent. of chromium is quite on a par with nickel steel with a percentage of 1.51 of that alloy.

It should be mentioned that the percentage of chromium used in the case of the steel tested by the writer at Kirkaldy's was that recommended by Professor Arnold as best suited for the manufacture of steel rails, tires, and axles.

Waterloo and City Railway.

Reports as to the opening of the Waterloo & City Railway have recently been revived in several newspapers, the date now named being July 1, but it is not at all likely that the opening date will be so soon. This tubular electric railroad, $1\frac{1}{2}$ miles in length, is to connect the London & South Western terminus with the heart of the City. It is to consist of two tubes, and at the point furthest from the surface they are some 60 feet underground. The whole of the electric installation has been carried out by the well-known firm of Messrs. Siemens Bros & Co., but the engines—six in number—used to work the dynamos have been supplied by Messrs. G. E. Belliss & Co., of Birmingham, as sub-contractors, and the boilers by Messrs. Davey, Paxman & Co. The latter are fitted with Vicars mechanical stokers.

The approaches to and exits from the new underground Waterloo Station are of a very extensive character, and will enable passengers to make their way to and from almost any part in the Southwestern terminus, and also direct to and from the adjacent thoroughfares without entering that terminus. They consist exclusively of inclined ways and staircases; no lifts are being put in owing to the fact that the distance to the surface is not more than 18 feet.

An important problem in connection with the new railway was how to get the rolling-stock for it down on to the rails. This has necessitated the carrying out of quite a large amount of subsidiary work in order to make connection with an empty carriage siding on the York Road side of Waterloo Station. This has been remodelled to some extent, and a lift, capable of carrying 30 tons, built alongside by Messrs. Armstrong. This lift descends into a tunnel which connects with the up tunnel of the new railway at a point some short distance north of the underground station. The rolling stock of the new line has been brought from America, the manufacturers being Messrs. Jackson and Sharpe, of Wilmington, United States. The carriages were brought over in sections to Southampton and then taken to the Southwestern Company's carriage works at Eastleigh, where they were put together. Thence they were brought up to the siding just mentioned, taken down the lift, and brought by way of the connecting tunnel on to the new railway itself. Even then, however, their preliminary peregrinations were not finished, for the bogies have to be taken up a smaller lift into the workshop, where they are now being fitted with electrical motors prepared for them by Messrs. Siemens. It is important to note that it is not proposed to use electrical locomotives on this line as on the City & South London, but motor cars and trailer cars after the style of the Liverpool Overhead Railway. The interior of the cars is similar to that of those used on the New York Elevated Railroad.

With regard to the City terminus at the Mansion House there is not much to be said. The platforms there will be each in its own iron tunnel, after the pattern of the City and South London stations, and the exits and entrances can only be temporary at present, as the more elaborate plan to be carried out in connection with the adjacent works of the Central London Railway must be postponed until the operations of the company are further advanced.

The local fare has been fixed at 2d. for a single journey, and 3d. return. The journey is expected to occupy five minutes, and trains are to be run at five minute intervals during the busy hours. The contractors for the whole of the tunnel work are Messrs. John Mowlem & Co.; the engineers for construction are Messrs. Galbraith and Kennedy, with whom the late Mr. Greadhead was associated until his death. Mr. Dalrymple Hay, resident engineer for the tunneling, has been taken seriously ill. Mr. D. Heap, now Professor Kennedy's assistant, will remain with the company as electrical engineer and superintendent.—Transport.

Treatment of Timber After Felling.

If timber is to remain in the log peel, cover the ends with cheap paint and always place on skids.

In ordinary yard seasoning "one year for every inch in thickness" is an old rule. Inch stuff of hard woods can be seasoned well by air-drying six months and then placing them in dry kiln or hot room. Conifers of all kinds can be dried very well by placing in dry kiln fresh from the saw. Dry-kiln seasoning disinfects lumber and thereby does much to increase durability.

Immersion in water for safe storage of wood is an old custom; it also improves the sapwood, since it allows the nitrogenous materials and part of the carbohydrates to be removed by fermentation without admitting the real wood-destroying fungi. Boiling and steaming, it is claimed, serve a similar purpose, and that all water treatments facilitate seasoning. Experiments on a large scale have not proven encouraging in this respect. The common assertion that rafting and hot-water treatment injure the wood by reducing its strength is entirely unsubstantiated. Long-time immersion hastens the darkening of wood.

Never apply paint or any other coating to green or unseasoned timber. If the wood is not well dried or seasoned the coat will hasten decay.

For coating, coal tar, with or without sand or plaster, and pitch, especially if mixed with oil of turpentine and applied hot (thus penetrating more deeply), answers best. A mixture of three parts coal tar and one part clean, unsalted grease, to prevent the tar from drying until it has had time to fill the minute pores, is recommended. One barrel of coal tar (\$3 to \$4 per barrel) will cover 300 posts.

Both tar and oil paint have the disadvantage that they act as mere covers. If the wood has any chance to get moist before painting they are harmful instead of useful. Heavy tar oils, freed of their volatile as well as their thick tarry constituents, such as are now offered in the market under the name of Carbolineum, are preferable to paints and tars. These oils penetrate and act as antiseptics, actually killing the fungi, or at least retarding their action and development. They are applied with brush, or else as baths, usually and preferably hot. They cannot replace paints where the looks of the material are to be improved.

Charring assists merely as an insulator, separating the wood from the ground, and, as fungi cannot eat their way through charcoal, they are prevented from entering. Generally, however, the process develops large cracks, and thus exposes the interior to the attacks of fungi.

Lastly, in communities where durable timber is scarce, and where, as in railroad building, large amounts of wood are used in situations which favor decay, it will pay to establish a plant for impregnating timber with antiseptics.—Circular from the U. S. Division of Forestry.

Foreign Railroad Notes.

Some German newspapers in railroad affairs seem to be nearly as "enterprising" as some American journals treating of, say, the explosion of the Maine. One of them, to emphasize the meanness of a German management which gave a man two marks for discovering a broken rail, quoted the case of an employee in Belgium who was given 50,000 francs for preventing a collision. Some brutal railroad man was impudent enough to ask the Belgian railroad management about the matter, and the reply was that it was true that a man had been rewarded for preventing a collision at the risk of his own life, but that the amount of the reward was 500 francs, and not 50,000.

The forms of correspondence in which the writer "most humbly" asks his "most honored" correspondent to "graciously" do something which perhaps he is bound to do anyway—forms which have come down from times of slavery or something like it—have been greatly softened down in the conduct of business in most countries, but in State administrations have survived longer than elsewhere. Now the government in Saxony has given formal instructions to all its officials and employees to stop all that nonsense in their official correspondence with each other, even when making petitions or requests to their superiors. Probably in our railroad practice there is not much of it to abolish.

A freight train on a steep grade going through the long Giovi tunnel, near Genoa, was drawn by one locomotive and pushed by two others. On emerging from the tunnel and reaching a down grade, the engineman of the rear pusher noticed that the engine next ahead continued under full steam. Suspecting that something was wrong, he ordered his fireman to make his way to that engine and shut off steam, and meanwhile reversed his own engine and whistled for brakes, and the train was brought to a stop just as it reached the next station. It then appeared that both engineman and fireman of the first pusher had been asphyxiated by the gases in the tunnel, and that just as the train stopped the engineman of the second pusher, the man who gave the alarm, fainted also.

TECHNICAL.

Manufacturing and Business.

Hollow stay bolts made by the Falls Hollow Stay Bolt Co. of Cuyahoga Falls, O., were specified on the locomotives recently ordered by the Brainard & Northern Minnesota Railroad from the Richmond Locomotive Works.

The Standard Car Truck Co. has moved its New York office from the Havemeyer Building to 315 Madison avenue, corner Forty-second street.

The O'Neil Crossing Alarm Co., Cleveland, O., re-

ports that its Highway Crossing Alarm is now in use on 40 of the leading railroads, many using it exclusively.

The American Steel Barge Co., West Superior, Wis., will build a stone and brick power house at its shipbuilding plant, which, with other improvements, will cost about \$50,000.

The McCord Journal box and lid have been specified on 250 cars for the St. Joseph & Grand Island, for which orders are about to be placed; on 500 cars ordered by the Northern Pacific from the Michigan-Peninsular Car Co.; on 35 logging cars for the Brainard & Northern Minnesota, ordered from the Illinois Car & Equipment Co.; on 25 cars ordered by the Iowa Central from the St. Charles Car Co.; on 200 cars for the Minneapolis & St. Louis, ordered from the Michigan-Peninsular Car Co.; on 20 cars for the Rio Grande & Eagle Pass, and on 250 cars for the Delaware & Hudson Canal Co., ordered from the Buffalo Car Works, and have been made the standard on the last named road.

Simplex body and truck bolsters, made by the Simplex Railway Appliance Co., were specified on 500 cars recently ordered by the Wabash and on 268 cars for the Choctaw, Oklahoma & Gulf.

The Mechanical Manufacturing Co., Union Stock Yards, Chicago, has an order to furnish 28 Ellis passenger car bumping posts for the new terminal station of the New York, New Haven & Hartford at Boston, Mass.

W. D. Sargent, President of the International Brake Shoe Co., left this week for Europe to make arrangements for the manufacture of the Diamond "S" Shoe in several European countries, including Russia.

On account of rush of work and consequent need of additional space the Walker Co. has found it necessary to add to its large machine shops at Cleveland. These shops now include three bays, each 400 ft. long, and a fourth bay, work on which is being rapidly pushed, will soon be completed and ready to receive the large machine tools which are to be placed there.

Pawling & Harnischfeger of Milwaukee have received a contract from the Aetna Standard Iron & Steel Co., Bridgeport, O., for six cranes, ranging in capacity from 15 to 20 tons each.

The National Boiler Works Co. of Syracuse, N. Y., has been incorporated with a capital of \$40,000. The Directors are: Wm. H. Wood, Howard N. Babcock, H. T. Webb and Robert Joy.

The Litchfield Machine Co., Litchfield, Ill., incorporated by S. M. Grubbs, Geo. W. Amsden and E. A. Amsden, will erect a plant to make machinery. The capital stock of the company is \$50,000.

Macey, Henderson & Co. have filed plans for a four-story brick and iron building for the Baldwin Locomotive Works, to be built in Philadelphia. The building will measure 30x150 ft., and will be used as a machine and pattern shop.

We are advised by the Wickes Refrigerator Car Co. of Buffalo that the Northern Pacific is changing all its Hamilton refrigerator cars to the Wickes system, and that the 250 cars recently built by the Chicago, Milwaukee & St. Paul, were built under the Wickes patents, and that the Grand Trunk is now building 250 of these cars at its Montreal shops.

The crank shafts, line shaft, thrust shaft and propeller shaft of the United States battleship Oregon, the wonderful performance of which, in steaming from San Francisco to Key West, without a breakdown of machinery, and reporting immediately upon her arrival for active service, has won the admiration of engineers, particularly those interested in marine machinery, are all hollow forgings, having a 6 in. hole through them. They were made by the Bethlehem Iron Co., South Bethlehem, Pa.

The Schoen Pressed Steel Co. of Pittsburgh is building an addition to its plant. The building will be of steel, 650 ft. long by 120 ft. wide, and will be equipped with overhead tramways, four overhead cranes, each with 60 ft. span, and a full complement of machinery. It is to be finished and in operation by Sept. 1 this year. This will increase the capacity of the works to 30 steel cars per day, in addition to the truck and bolster business. This company has just received orders for pressed steel bolsters for 3,750 cars, to be built for the Baltimore & Ohio Railroad by the Michigan-Peninsular Car Co. and the South Baltimore Car Works.

Iron and Steel.

Thomas Marshall, of the Marshall Foundry & Structural Works, Pittsburgh, has received a contract for furnishing the iron and steel structural work for the new post office to be built at San Francisco.

The city of Spokane, Wash., has ordered five miles of 48 in. riveted steel pipe for a water line.

Application has been made for a charter for the Sheridan Iron Works Co. The capital of the company will be \$50,000, consisting of 500 shares of \$100 each, of which 496 shares have been subscribed for by the Sheridan Iron Works, Ltd., an English corporation, which has a capital of £55,000, divided into £30,000 preference shares and £25,000 common shares. Of the £30,000 preference shares, £15,000 have been

subscribed for. The incorporators of the Pennsylvania company are: Garrett B. Stevens and William Kerper Stevens, of Reading; Edward Brueswitz, London, trustee for the English company; John S. Kennedy, Sheridan, and Philip H. Brice, Philadelphia.

The Compressed Steel Co. of Newark, N. J., has been incorporated with a capital stock of \$400,000, of which \$1,000 is paid up. The incorporators are: Henry Dickson and Peter Hassinger, Newark; Abram H. Ryan, Chas. F. Spaulding, Frank R. Wickes and Arthur A. Richmond, of East Orange, N. J.

The Titan Steel Co. of Chicago has been incorporated with a capital stock of \$500,000 by Eugene E. Prussing, Frank H. McCulloch and Edward Bernan.

The Chicago Rail Co. of Chicago has been incorporated by A. W. Charles, C. H. Binney and J. F. Curtis, with a capital stock of \$25,000.

The American Steel & Wire Co. has declared its first dividend—a quarterly payment of 1¼ per cent. on the preferred stock. This is payable Aug. 1. Transfer books were closed July 15.

The Morgan Steamship Co. has placed a contract with the Carnegie Steel Co., Ltd., for steel ship plates for four ocean steamships, to ply between the United States coast and South American ports.

New Stations and Shops.

The new station which the Chicago, Milwaukee & St. Paul will build at Green Bay, Wis., referred to in our issue of July 1, will be 135 ft. long by 35 ft. wide and one story high. The exterior walls will be of mottled yellow pressed brick with blue Bedford stone up to the first story window sills; the roof will be of tile. The contract for the building complete, excluding the heating apparatus, has been let to Charles W. Gindele & Co. for \$12,425. The heating apparatus is estimated to cost about \$1,000 and the station platforms will be built by the railroad company. Frost & Granger, Chicago, are the architects.

Regarding the reports to the effect that the Union Pacific will build a 20-stall roundhouse at Rawlins, Wyo., we are advised by the road that nothing has been done as yet.

The Chicago, Burlington & Quincy has opened its new station in Omaha.

The Chicago, Burlington & Quincy has awarded a contract for building the new freight-house in Quincy to the F. W. Menke Stone & Lime Co., and this firm has sublet the woodwork to Emerkin & Kaempfen and the brickwork to Steinbach Bros. The building will be 500 ft. long and 50 ft. wide. We understand that the company is now ready for bids on the new passenger depot.

It has been recently reported that the Baltimore & Ohio shops, now located at Chicago Junction, were to be moved to Tiffin. We are officially advised that there is nothing in this report.

Westinghouse Air Brake Stock.

At the special stockholders' meeting of the Westinghouse Air Brake Co. on Tuesday of this week it was voted to increase the capital stock to \$11,000,000. The proposition to do this was announced some weeks ago, and there was very little doubt that the stockholders would agree to it.

Leased Electric Power.

The question of economy of leased electric power, compared with the cost of generated power, has often been raised, but lack of sufficient reliable information has made it difficult to decide the question. The current issue of the American Electrician contains reports from companies in all parts of the United States showing the cost of leased power in each individual case. Some lease the power on the basis of the price charged per KW. hour, others on the basis of a fixed amount per car mile, while the more common practice is to charge a fixed price for power for each car. Another basis which is not quite so common is to base the charge on the price per car mile. Of the more common method, that of charging a fixed amount per car used, the figures range from about \$1.80 to \$4.50 per car per day. Many cars, however, are supplied with power for about \$2 per car running for 18 hours or more each day than is received for power at the higher rates. Charging on the basis of the car mile or per KW. hour for the current used would seem to be the most practical basis for such charges, but necessitates the additional expense of keeping accurate mileage and power consumption records. The lowest rate reported is charged to a road in Georgia running 24 motor cars and 9 trail cars on 18 miles of track and paying 1.1 cents per KW. hour. This amounts to but 0.82 cent per H.P. hour. In this case, however, no information is given regarding the grades or the number of hours run, but it is assumed that the cars are in service nearly, if not all, of the 24 hours. On this basis of charging it makes, of course, but little difference in regard to the number of hours run; but on the other bases the number of hours which the cars are in service determines largely the rate charged.

Torpedo Boat Driven by Steam Turbines.

The Parsons Marine Turbine Co. of Newcastle-on-Tyne has been directed to build a torpedo boat destroyer to attain a speed of 35 knots (over 40 statute

miles) an hour, which is nearly three knots in excess of the new destroyer "Express," which is now being built. Should the speed of the new boat be attained it will be the fastest vessel afloat.

Chicago Public Works.

On July 8 Commissioner of Public Works McGann let contracts for the superstructure of the crib which will supply water to the new northwest tunnel. Eleven propositions were received and the contract was given to the lowest bidders and was distributed as follows: The Fitz-Simons & Connell Co., general work, \$14,476; electric work, \$1,864.50; the Pittsburgh Bridge Co., steel work, \$10,400; J. J. Wade & Son, plumbing, \$375; M. J. Cragin, steam fitting, \$4,026. The crib will be completed ready for use in six months and will be known as the Carter H. Harrison Crib, in honor of the Mayor. It will be located three miles from the shore, east of Oak street and north of the Chicago River, and the intake will be the largest so far built in Chicago.

A 25 ft. cave-in occurred July 8 in Section 3 of the Northwest land tunnel near Keith street, but no one was injured.

Gas Explosion in a Tunnel.

A few minutes before seven o'clock on the evening of July 11 an explosion occurred in the waterworks tunnel which is being built under Lake Erie at Cleveland, O. The explosion occurred some 6,000 ft. from the head of the tunnel, and the eleven workmen are believed to have been killed. But one man in the tunnel at the time of the explosion escaped, he being 3,700 ft. from the shore. According to his report a series of explosions occurred, producing a great concussion of air. Attempts made on July 12 to rescue those at the end of the tunnel indicated that it would be some days yet before the gas would be sufficiently cleared to permit any one to venture to that part where the explosion occurred. On May 11 last an explosion of gas occurred near the head of this tunnel, resulting in the death of eight men. (See Railroad Gazette, May 20, 1898, page 357.)

Lignite for Locomotive Fuel.

Mr. S. R. Tuggle, Superintendent of Motive Power and Machinery, Houston & Texas Central, at the April meeting of the Texas Railway Club, described the results obtained from the use for fuel of lignite, large beds of which are near the main line of the road. Experiments were first made by burning lignite under the boilers at water stations, and later it was found economical to use it at the car shops, the creosoting plant and under all stationary boilers. By changing the draft appliances and putting on diamond stacks it was found that lignite alone could be burned on switching engines, and that a mixture of about equal parts of lignite and Territory or Frisco coal was suitable for road engines. The fuel records of this road show that in January, 1896, in all classes of service, the locomotives made 29.9 miles per ton of coal at a cost of 11.06 cents per locomotive mile, while in January, 1898, corresponding figures are 28.3 miles per ton of coal, costing 6.41 cents per mile, or a reduction of 4.65 cents per locomotive mile. The following comparative figures by years were also given: Average cost of fuel per locomotive mile; 1894, 9.55 cents; 1895, 7.99 cents; 1896, 7.68 cents; 1897, 6.54 cents. The use of lignite was begun in 1895. Mr. Tuggle also stated that an indirect saving was effected by the shorter haul from the lignite mines, while the expenses for repairs to flues, stay-bolts and fireboxes have decreased since lignite has been used for locomotive fuel.

THE SCRAP HEAP.

Notes.

The Chicago Great Western has issued an order to have freight locomotives pooled on each operating division.

The Boston & Maine will hereafter pay its employees in cash instead of checks. Assistant paymasters will do the work at large places, and at smaller stations money will be sent to the station agents.

The State Auditor of South Dakota has notified officers of the state that hereafter, when public money is granted them for railroad fares, they must produce receipts showing that the money is actually expended for that purpose.

The Chicago City Council has passed the Nelson Fender ordinance, providing that street cars shall be equipped with steel basket fenders by Sept. 1, 1898, and making it unlawful for street railway companies to operate cars without fenders.

On July 1 the track repairmen of the Canada Atlantic began a strike for increased wages. The demand was for an advance from \$1 a day to \$1.10, but when this was refused by the company, \$1.25 was demanded. After about one week the company agreed to pay \$1.10, and the men returned to work. It is said that about 600 struck.

President Ripley, of the Atchison, Topeka & Santa Fe, has notified employees that they may insure against accident with the Railway Officials' & Employees' Accident Association, of Indianapolis, at reduced rates. The Association is allowed the exclusive privilege of collecting premiums through the paymaster, and in return for this it gives certain concessions in the conditions of policies.

The Northern Pacific has established an insurance department and will discontinue all policies with fire insurance companies when they expire. Mr. E. W. Osborne has been appointed insurance inspector. He will regularly inspect all buildings and other property of the company liable to damage by fire. This officer will report his findings to the Division Superintendent and to the Assistant Secretary of the company, Mr. W. H. Gemmell, who will have charge of the insurance department. The inspector will be accompanied over each division by the Supervisor of Bridges and Buildings for that division.

Steamship Contract in Nicaragua.

The Government of Nicaragua has made a contract with the Pacific Steam Navigation and South American Steamship Companies of Valparaiso, Chile, the principal features of which are as follows: The companies are to give service according to an established itinerary between Valparaiso, Chile, and ports of Central America as far as Ocos, Guatemala. A steamer shall arrive once every week at Corinto or San Juan del Sur and make two connections each month at Colon for New York. In case of the extension of the service to Mexican or Californian ports the itinerary may be modified; but in no case shall the steamers touch at Corinto or San Juan del Sur less than four times a month. The steamers are to carry the mails according to the proper regulations, and to convey with a rebate of 25 per cent. from the usual tariff workmen, farmers, mechanics and all others who may immigrate to the state, when coming under contract or engaged by the Government. The same reduction will be made for the transportation of Government cargo and of troops in times of peace; and six round-trip first class passages between the ports of Corinto and San Juan del Norte will be furnished gratis to the Government. The usual stay of the steamer in each port shall be six hours; but the Government may detain it for 12 hours. During the coffee season each boat shall reserve space for not less than 150 tons for each trip. The steamers shall be exempt from customs dues, maritime or port, fiscal or municipal charges, and the companies shall have the free use of the national telephones and telegraphs in the service. For each time that the steamers fail to follow the itinerary or are more than eight days late a fine of 100 pesos (\$26.50) will be imposed. The Pacific Steam Navigation Co. has the right to extend the service of its boats plying in the cattle traffic on the coast of Colombia from Panama to Chiriqui, to San Juan del Sur, Corinto, or other ports in Nicaragua. For these services the Government is to pay an annual subvention of 9,000 pesos (\$2,285) and all differences in the interpretation of the contract shall be referred to arbitrators.

Taxation of Railroads in Colorado.

Receiver Frank Trumbull, of the Union Pacific, Denver & Gulf, has written to the Governor of Colorado advocating a higher assessment of mines and a reduction of the taxation of railroads. He relates the reverses that almost all of the Colorado lines have met in past years, and shows the enormous taxation they have been burdened with regardless of the times, and then shows how the mines have escaped with only nominal assessments. Of the 4,501 miles of line in the state only 760 have escaped the hands of the courts—some of them having been in the control of a receiver several times. The Union Pacific, Denver & Gulf pays taxes in Colorado on \$5,000,000, while "the assessed value for all mines for the whole state was, in 1897, about \$8,000,000. There is one mine at Cripple Creek—perhaps more than one—which could not be purchased for this amount. The gross output of Colorado mines is estimated for the same year at \$37,373,509. Colorado assesses Union Pacific, Denver & Gulf at a rate approximating 5 per cent., and the Denver, Leadville & Gunnison at a rate approximating 6½ per cent. on gross earnings, while mines pay not more than three-quarters of 1 per cent."

International Electrical Exhibition at Como, Italy.

In 1899 an electrical exhibition will be held at Como, the birthplace of Alexander Volta, who was so prominently identified with the early discoveries in electricity. The exhibition will open May 15, closing Oct. 15 of the same year. During this period it is proposed to hold a congress of electricians for the free discussion of electrical subjects. For the encouragement of the exhibitors the city of Como has decided to give 10,000 francs in prizes for new inventions in the field of electricity.

Safety Ticket Paper.

Secretary A. J. Smith of the American Association of General Passenger & Ticket Agents has issued a circular calling attention to the vote of the Association at its meeting at St. Louis last October looking to the universal use of "Perfect Safety Paper" for interline tickets by the year 1900. Members are reminded to take care not to use any other so-called safety paper in printing interline tickets. The manufacturers of the paper adopted by the Association make a number of colors, and samples of these colors accompany the present circular. The Executive Committee, acting under the authority granted at St. Louis, offer the right of using the safety paper to any transportation line provided it applies for membership in the Association.

The Evolution of Comfort.

The Pall Mall Magazine for July has an article on the "Evolution of Comfort in Railway Traveling in America," by Mr. Angus Sinclair. One illustration shows the interior of the first Pullman car, and by contrast there are pictures of observation, chair and officers' cars, day coaches and dining cars of the present time. The Pintsch light furnishes the decorations, as far as lamps are concerned, in all the modern cars shown, although one of them has electric lights also. Mr. Sinclair says that at first the proprietors did not think that lighting the cars at night was any more a necessity than it was to light stage coaches. Railroads had been carrying passengers in this country several years when an advertisement was put in a Baltimore paper intimating that a certain railroad was so solicitous for the comfort of its patrons that two candles had been put in each car of the night train. That was the kind of light luxury provided for many years. A great variety of oil lamps were tried, and some of them threw a very good light upon the roof, but they were a delusion to the person who tried to read by them. The line of progress was towards gas, and a great many systems of gas lighting were tried. None were

satisfactory until the Pintsch gas was introduced. He gives the C., B. & Q. credit for the first regular dining car.

Railroad Taxes in North Carolina.

The North Carolina Railroad Commissioners have finished their valuation of the railroads of the State for taxation and report a total valuation of \$34,748,553. This is an increase of about five millions over last year and 12 millions over 1896; and is nearly three times the valuation of seven years ago. The increased valuation on the lines of the Southern Railway is \$1,536,725; Atlantic Coast Line, \$2,080,796; Seaboard Air Line, \$773,890. The Western Union Telegraph Company's valuation is increased from \$618,000 to \$1,000,000.

An Early Iron Bridge.

Within the past month the first iron railroad bridge erected in the state of Ohio has been removed. This bridge was over Salt Creek on the Central Ohio division of the Baltimore & Ohio Railroad, in Muskingum County, and was built in 1851. It was a single span, 71 feet in length, and was a Bollman deck truss bridge, with plate girders. Bollman was at that time Chief Engineer of Construction of the Baltimore & Ohio.

The Right to Supply Electric Power.

In the United States Circuit Court, at Chicago, Judge Grosscup, on July 5, handed down a decision denying the right to the Chicago General Street Railway Company to supply electric power to its customers in the lumber district, and refused to enjoin the city from preventing such supply. He finds that the city authorities did not invade any of the rights of the Chicago General Railway Company when it cut the company's wires, because the charter permitting the company to sell light, heat and power does not give it the right to use the city streets unless specially authorized by the city. This case has been in the courts for several months. The railroad company has been supplying current for light, heat and power to a number of lumber yards and machine shops. To this the city of Chicago objected, contending that it was a source of public danger and that the railroad company must restrict its supply of motive power to its own trolley lines.

Forest Concession in Nicaragua.

A Consular report from San Juan del Norte of Nicaragua states that H. C. Emery, of Chelsea, Mass., has renewed a contract with the Nicaraguan Government. Under the new agreement Mr. Emery receives a concession for 10,000 manzanas (about 17,500 acres) of land, to be used for cultivation only, for fifteen years. He has the privilege of cutting the mahogany, rosewood or cedar, which averages about one tree to the acre and about two and one-half logs to the tree. The contract requires the building of 50 miles of railroad within the period, to be located at such places as are best suited to Mr. Emery. It is calculated that he will not ship less than 12,500 logs per annum, for which he will pay \$20,000 gold down and \$10,000 gold per annum for the fifteen years. The contract was dated at Managua, March 2.

A Tunnel Across the Straits of Gibraltar.

Mr. Berlier, who has built two tunnels under the Seine, proposes now to tunnel the Straits of Gibraltar. He will let England peacefully watch the surface of the sea while he will establish safe communication underneath the water with or without the permission of England. He would not cross at the narrowest part of the Straits, but leave the European coast at the Bay of Vaqueros and land in Africa at Tangiers. The distance, including the approaches, would be about 41 kilometers, and the greatest depth of the water on this line would be 400 meters. At the narrowest part of the Straits it is 600 meters. The tunnel could be built in seven years, during which time the railroad along the coast of Morocco to connect with the Algerian system could be built. The cost would be 225,000,000 francs, and on this capital, according to wise calculations, a sufficient interest would be returned by the traffic; (d'après de savants calculs serait suffisamment rémunéré). It is reported, also, that M. Berlier is building several castles in Spain.

Private Telephone Exchanges.

Private branch telephone exchanges are now in use by 18 different railroads in the United States, and the officers of the American Telephone & Telegraph Company inform us that negotiations are pending with several other companies. Although the word "branch" is used in describing these establishments, they are really independent telephone exchanges. The railroad or other party using and managing the exchange employs the operators, but the care and maintenance of the wires and apparatus are wholly in the hands of the Telephone Company, from which the property and rights are leased. In all of these exchanges every instrument is suitable for long distance communication and every one is connected by a metallic circuit. The number of exchanges established on these 18 railroads is 31, of which 14 are in Chicago, three on the Chicago, Burlington & Quincy; two on the Chicago, Rock Island & Pacific, and one each on the other prominent roads. The Pennsylvania Railroad, as heretofore noted in the Railroad Gazette, has leased wires for telephone connection between New York and Pittsburgh. There are exchanges at New York, Jersey City, Philadelphia, Washington, Harrisburg, Altoona and Pittsburgh.

The Port of Liverpool.

Parliament has just passed two acts giving the necessary authority to the Mersey Docks and Harbor Board to make the proposed improvements and extensions in the Liverpool dock system, upon which a report has already been sent to the department. The amount authorized by Parliament is larger than the sum originally estimated. The exact total provided for in the two acts is \$24,115,320. Of this amount \$6,804,000 is supplementary to the sum of \$7,776,000, authorized by a special act of 1891, to be expended for extending, deepening, and otherwise improving the docks. These improvements are nearing completion. Under the act of 1891, and the two acts just passed, there have been authorizations for the expenditure of \$31,891,320 for the improvement of the Liverpool docks. Even this amount does not give the grand total. The acts of 1891 and 1898 are for special and extraordinary improvements; and, in addition, there are the ordinary improvements made from time to time and paid for out of the current revenue of the board. The last of the sailing pilot boats has just been withdrawn from active service, and now the Liverpool pilot boats are all steam vessels.

The Biograph at the Conventions.

The American Mutoscope Company furnished an interesting entertainment at the Saratoga conventions in the form of biograph displays of pictures of scenes and action. The exhibition was highly appreciated and the Committee on Entertainment has written to the company expressing its gratification with what the Mutoscope Company did. This company, as the reader may know, controls some excellent patents and processes for making and exhibiting photographs of motion, and Mr. George R. Blanchard is president of the company.

Engineering Works in Honduras.

Surveys are to be made at once of the River Patuca, Honduras, as preliminary to making plans and estimates for jetties, improving navigation, building a railroad, docks, warehouses, etc. It is expected that the work of construction will begin in September. This work is to be carried on by the American-Honduras Company, which has a Government concession, and a preliminary survey has already been made. The Patuca River is 300 miles long, of which 150 miles is navigable. Mr. J. Francis LeBaron, of Jacksonville, Fla., sailed this week to take up the work of surveys as Chief Engineer.

Standard Coupler Co.

This company has announced a dividend of 4 per cent., semi-annual.

Quick Bridge Building.

The bridge builders of the Pittsburgh Division of the Baltimore & Ohio recently made a record which they think will stand comparison with anything else of the kind. The Supervisor of Bridges at Connellsville received notice at 1:30 a. m. that a bridge had been burned at a point 70 miles away. He got 15 bridgemen together, loaded three cars with heavy timber, ran the 70 miles to the site of the bridge, and built 104 ft. of trestle in 10 hours 55 minutes, the first engine passing over the bridge at 12:25 p. m. The special train was delayed on the road about 20 minutes by other trains.

The Engineers' Club and the Manila Fight.

We judge that the following letter needs no explanation or comment:

"Flagship Olympia,
"Manila, May 24, 1898."

"Sir—Admiral Dewey wishes me to express to the Engineers' Club of New York his high appreciation of the action of the club in cabling congratulation to him and to the members of the Engineer Corps attached to this squadron upon the naval victory of May 1.

"The telegram was read on the quarter deck of all vessels of the squadron with all hands at muster.

"Such prompt appreciation of services rendered to the country is a great incentive to continued effort. Very sincerely,

"T. M. BRUMBY,

"Flag Lieutenant.

"Secretary Engineers' Club,
New York."

The Boston Elevated.

The Board of Railroad Commissioners of Massachusetts have partially completed their work of approving or disapproving the plans for the Boston elevated system, and on Tuesday of this week its findings, as far as it had proceeded, were given to the public. It disapproves of the location of the proposed station of the system at the new South Terminal Station, and as a result new plans have been drawn, locating the station on Atlantic avenue, near the exit from the subway of the terminal station. The old plan was for an "island station" in the square at the foot of Summer street. It has also secured substitute plans for the station in Roxbury, at Dudley street, which will carry it north of the original location 150 ft., with the grade of the approaches 4½ per cent. instead of 8 per cent. Provision has been made for a possible separation of grades at the crossing of the Mystic branch of the Boston & Maine Railroad, by meeting conditions which may be imposed by the special commission having this matter in charge. The details of the stations and track construction still remain to be approved.

A New Record by the Kaiser Wilhelm der Grosse.

Report has just been received from the agents of the North German Steamship Co. that the Kaiser Wilhelm der Grosse has made the last Western trip in five days, nineteen hours and thirty-five minutes, covering the course of 3,146 knots at an average hourly speed of 22.54 knots. Her previous eastward record, made last November, averaged 22.35 knots.

Decision in Suspended Switch Case.

On June 23 the Circuit Court for the Eastern District of New York, sitting at Brooklyn, rendered a decree and injunction in the case of the Thomson-Houston Electric Company versus J. G. Buehler, F. H. Platt and the Columbia Machine Works. The case came up on an alleged infringement of the patents of Charles J. Vandepoele, dated April 1, 1890, No. 424,695, for improvements in suspended switches and traveling contacts for electric railroads. The claims covered by the infringement are those well known in the Vandepoele patents, and include the combination with an overhead wire for receiving an underneath contact, together with such bracing, wheel flanges and other apparatus required to make the necessary contact between the trolley pole and the wire. It also includes the arrangement for the overhead conductor switch in a branching electric railroad. The decree upholds the claims, and orders that the defendants pay \$175 in costs for using the apparatus covered by the claims in this patent.

LOCOMOTIVE BUILDING.

The Union Pacific has issued specifications for 10 locomotives.

It is reported that the Oregon Short Line is in the market for some new locomotives.

The Schenectady Locomotive Works are building seven six-wheel locomotives for the Northern Pacific.

The Baldwin Locomotive Works are building two locomotives for the San Francisco & San Joaquin Valley.

The Houston East & West Texas has placed an order with the Baldwin Locomotive Works for five locomotives, the dimensions to be the same as of the last lot.

As stated in the Car Building column, we are officially informed that the Iowa Central has been con-

sidering buying some new equipment, but that nothing definite has been done.

CAR BUILDING.

The Pittsburgh & Lake Erie is not in the market for 10 new passenger cars.

It is reported that the Oregon Short Line is in the market for some new freight cars.

The Ensign Mfg. Co. has received an order from the Chesapeake & Ohio for 500 coal cars.

The Missouri Car & Foundry Co. is building 200 freight cars for the International & Great Northern.

The St. Paul & Duluth is considering buying 200 cars, but will not order until after July 26, when its Directors meet.

We are officially informed that the Iowa Central has been considering buying some new equipment but that nothing definite has been done.

The Union Pacific has ordered from Pullman's Palace Car Co. 1,000 box cars of 60,000 lbs. capacity and is about to order a second thousand.

The Flint & Pere Marquette has placed an order for 250 cars with the Michigan-Peninsular Car Co. These cars were mentioned in our issues of June 3 and July 1.

It is reported that the Chesapeake & Ohio has placed an order with the Michigan-Peninsular Car Co. for 1,000 box cars, but we have not been able to get this report confirmed up to the time of going to press.

The Baltimore & Ohio has placed contracts with the Michigan-Peninsular Car Co. for 3,000 freight cars and with the South Baltimore Car Works for 750 freight cars. Schoen pressed steel bolsters will be used on these cars.

The Northern Pacific has placed an order for 500 70,000-lb. box cars with the Michigan-Peninsular Car Co., in addition to the 500 ordered from the Illinois Car & Equipment Co., and noted in our issue of last week, making 1,000 cars so far ordered.

The Rodger Ballast Car Co. is building 42 of its ballast cars for the Lehigh Valley to be used for handling broken stone ballast. These cars are to be of 80,000 lbs. capacity and will carry 30 cu. yds. of crushed stone. They will be delivered Aug. 1.

The 500 box cars ordered by the Northern Pacific from the Illinois Car & Equipment Co. and mentioned in our issue of last week, are to be 36 ft. long and 70,000 lbs. capacity and are to be delivered in August. They are to be equipped with axles made by Willard Sons & Bell, Bettendorf bolsters with Barber roller bearing device, Westinghouse air brakes, Tower couplers, Dunham doors and Chicago grain doors, McCord journal boxes and journal box lids, Chicago roofs and cast iron brake shoes.

The 500 cars ordered by the Wabash from the St. Charles Car Co. and noted in our issue of July 8, are to be Wabash standard 60,000-lb. capacity cars for delivery during the last half of August. They will be 36 ft. long in clear, 8 ft. 4 in. wide in clear, 7 ft. high in clear, will weigh 32,000 lbs. They will have wood and metal underframes, iron axles, Simplex metal bolsters, metal brake beams, M. C. B. cast iron brake shoes, Westinghouse air brakes, brass brasses filled with babbit metal, Gould No. 3 shank couplers, Dunham doors, malleable iron journal boxes and lids, mineral paint made by the Pennsylvania Paint Co., Hutchins prepared roofing, graduating five nest coil springs, diamond trucks, 33 in. cast iron wheels, weighing 600 lbs. each, Wabash standard draft rigging; no platforms.

BRIDGE BUILDING.

CALUMET, QUE.—The bridge across the River Rouge, which was swept away by flood last week, will be rebuilt by the Canadian Pacific.

CAMDEN, N. J.—B. F. Sweeton & Son, Camden, N. J., have been awarded the contract for building a new steel bridge over Cooper's Creek at State street. The contract price is \$22,776. The other bidders were the Oswego Bridge Co. and the Croton Bridge Co.

CHICAGO.—After considerable litigation Judge Gibbons, Chicago, has decided that the Sanitary District must build a three-track bridge for the Chicago & Western Indiana RR. where its right of way is crossed by the Drainage Canal.

CLEVELAND, O.—Bids were opened on Friday last for building the Martin-Braha bridge. The cost will be about \$30,000. The Willett street bridge will cross at Bailey street, the estimated cost being \$105,000.

COLUMBUS, O.—The building of the bridge over Big Walnut River, on the Groveport Pike, was awarded, June 28, to the new Columbus Bridge Co., the bid being for \$11,700. This bid is for a middle pier and the superstructure. J. A. Swingle & Co. was awarded the contract for the superstructure at \$9,330.

INDIANAPOLIS, IND.—The Indianapolis & Vincennes Railroad has let the contract for the steel bridges at Gasport and Salem.

INGERSOLL, ONT.—Sealed tenders are being received by W. R. Smith, Town Clerk, for the construction of a steel bridge over the River Thames, in the town of Ingersoll; to be 190 ft. long, with a 14 ft. roadway, one span.

JACKSON, MISS.—Sealed proposals will be received until 3.30 p. m., Aug. 2, at the City Hall for furnishing all labor and materials for either or all of the following items: (1) Construction of brick or concrete abutments for the truss bridges at Capitol street and Pascagoula street. Sheets 1 and 4. (2) Construction of brick or concrete abutments for the truss bridge at Pascagoula street. Sheet 4. (3) Removal from Capitol street to Pascagoula street of an iron pony-truss bridge, 85 ft. c-c end pins, 33 ft. wide. Sheet 4. (4) Building and erection at Capitol street of a steel truss bridge 86 ft. c-c end pins, 100 ft. wide, 4 trusses, designed to carry buckled-plate floors and brick paving, but to be built now either (A) with wood floors or (B) with buckled-plate floors

and brick paving. Sheet 2. (5) Construction at Capitol street of a concrete-steel arch bridge, system Melan, 100 ft. wide, 2 spans each 42½ ft. Sheets 5 and 7. (6) Construction at Capitol street of a concrete arch bridge 100 ft. wide, 2 spans each 42½ ft. Sheet 3. (7) Construction at Capitol street of a brick arch bridge 100 ft. wide, 2 spans each 42½ ft. Sheet 3. Contracts let will include one of the following alternate plans, at the option of the board: (I) Items 1, 3, 4; (II) Items 2, 3, 5; (III) Items 2, 3, 6; (IV) Items 2, 3, 7. Bidders for items 4, 5, 6 or 7 must also bid on item 3. Form of contract, specifications and proposals, also such sheets of prints as are requested can be obtained from D. P. Porter, Jr., City Clerk, or Walter G. Kirkpatrick, City Engr.

NORRISTOWN, PA.—The County Commissioners have advertised for proposals for building two bridges, one over the Manatawny Creek at Pottstown, and the other over the Perkiomen Creek, at Dodd's Hall Mill. They have also advertised for proposals for the masonry work for the above-mentioned bridges. Mr. D. H. Hitler of Norristown, Pa., may be addressed regarding the proposals.

PITTSBURGH, PA.—The Pittsburgh, Bessemer & Lake Erie RR. has nearly completed the bridge at Port Perry. The bridge was open July 9.

QUEBEC, QUE.—A steel bridge to replace the Bickells bridge will be erected at a cost of \$10,000.

TOLEDO, O.—J. L. Pray & Son, Whitehouse, O., have been awarded the contract for building the masonry abutments for the bridge on Swan Creek.

WILMINGTON, DEL.—The wooden bridge over the Cristina has been torn down and an iron structure will be put in its place. It is expected that railroad trains will be run over the new bridge by Sept. 1. In the meantime the Baltimore & Ohio trains are using the cut-off of the Wilmington & Northern.

WINGHAM, ONT.—A one span iron bridge, 100 ft. long, will be built at Wingham; 16 ft. roadway, height above water 30 ft. Address John Ansley, County Commissioner.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Augusta & Savannah.—Two and one-half per cent., payable July 5.

Belt Railroad & Stock Yards.—Two and one-half per cent. on common stock and 1½ per cent. on preferred stock, quarterly, payable July 1.

Burlington, Cedar Rapids & Northern.—Two per cent., payable Aug. 1.

Central Railroad of New Jersey.—One per cent., payable Aug. 1.

Georgia Railroad & Banking.—Quarterly, 2½ per cent., payable July 15.

Mine Hill & Schuylkill Haven.—Three per cent., payable July 15.

Vermont Valley.—Three per cent., payable July 1.

Wrightsville & Tennille.—Three and one-half per cent. on common and preferred stock, payable July 1.

Brooklyn City.—Quarterly, 2½ per cent., payable July 15.

Cincinnati Street Railway.—Quarterly, 1¼ per cent., payable July 1.

Cleveland City Railway.—Quarterly, ¾ per cent., payable July 9.

Cleveland Electric Railway.—Quarterly, ¾ per cent., payable July 5.

Hestonville, Mantua & Fairmount Passenger Railway (Phila.).—Two per cent. on common and 3 per cent. on preferred stock, both payable July 1.

Lindall Railway (St. Louis).—Quarterly, 1¼ per cent., payable June 30.

Missouri Railroad (St. Louis).—Quarterly, 1½ per cent., payable June 30.

Southern Electric Railway (St. Louis).—Three per cent. on preferred stock, payable July 1.

United Traction (Pittsburgh).—Two per cent. on preferred stock, payable July 5.

Waterbury (Conn.) Traction.—Quarterly, 1 per cent., payable June 30.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

American Society of Civil Engineers.—Meets at the house of the society, 220 West Fifty-seventh street, New York, on the first and third Wednesdays in each month at 8 p. m.

American Society of Railroad Superintendents.—Annual meeting, Crossman House, Alexandria Bay (Thousand Islands), N. Y., July 13 and 14.

Association of Engineers of Virginia.—Holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.

Boston Society of Civil Engineers.—Meets at 715 Tremont Temple, Boston, on the third Wednesday in each month at 7.30 p. m.

Canadian Society of Civil Engineers.—Meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday at 8 p. m.

Central Railway Club.—Meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

Chicago Electrical Association.—Meets at Room 7, 137, Monadnock Building, Chicago, on the first and third Fridays of each month at 8 p. m. J. R. Cravath, secretary.

Civil Engineers' Club of Cleveland.—Meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

Civil Engineers' Society of St. Paul.—Meets on the first Monday of each month except June, July, August and September.

Denver Society of Civil Engineers.—Meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month except during July and August.

Engineers' Club of Cincinnati.—Meets at the rooms of the Literary Club, 25 East Eighth street, on the third Thursday of each month, excepting July and August, at 7.30 p. m.

Engineers' Club of Columbus (O.).—Meets at 12½ North High street on the first and third Saturdays from September to June.

Engineers' Club of Minneapolis.—Meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

Engineers' Club of Philadelphia.—Meets at the house of the club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month at 8 p. m., except during July and August.

Engineers' Club of St. Louis.—Meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

Engineers' Society of Western New York.—Holds regular meetings on the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

Engineers' Society of Western Pennsylvania.—Meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month at 7.30 p. m.

Locomotive Foreman's Club.—Meets every second Tuesday in the clubroom of the Correspondence School of Locomotive Engineers and Firemen, 335 Dearborn street, Chicago.

Montana Society of Civil Engineers.—Meets at Helena, Mont., on the third Saturday in each month at 7.30 p. m.

National Railroad Master Blacksmith Association.—Sixth annual convention, Boston, Sept. 6.

New England Railroad Club.—Meets at Pierce Hall, Copley Square, Boston, Mass., on the second Tuesday of each month.

New York Railroad Club.—Meets at 12 West Thirty-first street, New York City, on the third Thursday in each month at 8 p. m., excepting June, July and August.

Northwest Railway Club.—Meets on the first Tuesday after the second Monday in each month at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

Northwestern Track and Bridge Association.—Meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

St. Louis Railway Club.—Holds its regular meeting on the second Friday of each month at 3 p. m.

Southern and Southwestern Railway Club.—Meets at the Kimball House, Atlanta, Ga., on the second Thursday in January, April, August and November.

Technical Society of the Pacific Coast.—Meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month at 8 p. m.

Western Foundrymen's Association.—Meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A. Sarge, Jr., 1533 Marquette Building, Chicago, is secretary.

Western Railway Club.—Meets in Chicago on the third Tuesday of each month at 2 p. m.

Western Society of Engineers.—Meets in its rooms on the first Wednesday of each month at 8 p. m., to hear reports and for the reading and discussion of papers. The headquarters of the society are at 1736-1739 Monadnock Block, Chicago.

Society for the Promotion of Engineering Education.

The fifth meeting of this society will be held in Room 22 of the Walker Building of the Massachusetts Institute of Technology, Boston, Mass., Aug. 18-20, 1898. J. B. Johnson, St. Louis, Mo., is President, and Albert Kingsbury, Durham, N. H., is Secretary.

Canadian Electrical Association.

The eighth annual convention of the Association was held at the Windsor Hotel, Montreal, June 28, 29 and 30. The programme, as briefly given in our issue of June 24, page 465, was carried out. Some of the papers, particularly the one on the "Electrical Utilization of Water Powers," by Mr. L. D. Magie, were of considerable value to electrical engineers.

At the meeting on June 30 the following officers were elected for the ensuing year: President, William H. Browne; First Vice-President, H. P. Gwilt; Second Vice-President, A. A. Dion; Secretary and Treasurer, C. H. Mortimer.

American Association for the Advancement of Science.

The Association will meet in Boston, Aug. 22-27. The Council will meet Aug. 20 at the Rogers Building of the Massachusetts Institute of Technology, and the meetings of the various sections will be held at the Institute. Full details of arrangements can be secured from the local secretary, Prof. H. W. Tyler, Massachusetts Institute of Technology, Boston. A number of affiliated societies will meet in Boston during the same week, among them the Society for the Promotion of Engineering Education, which will hold its sessions in Room 22 of the Walker Building of the Institute from Aug. 18 to 20 inclusive.

American Society of Civil Engineers.

The Secretary has issued a second convention circular, under date of July 8. Answers received to the circular of June 11, 1898, indicate a large attendance.

As stated in a previous circular, the Wabash Railroad Co. will furnish free transportation to the members of the society, and the members of their immediate families. The Chicago & West Michigan and the Detroit, Grand Rapids & Western will furnish free transportation to members and to the members of their immediate families from Grand Haven to Detroit and return via Grand Rapids. The Flint & Pere Marquette Railway Co. will also furnish free transportation to members who desire to use its lines in going to and from the convention.

Through C. A. Wilson, M. Am. Soc. C. E., Chief Engineer, the Cincinnati, Hamilton & Dayton will provide free transportation to members of the society and the members of their immediate families from Cincinnati to Toledo and return.

The special train from New York, on which transportation will be free to members of the society and to members of their immediate families, will be made up of day coaches for the run from New York to Suspension Bridge. At Suspension Bridge a train of Wagner sleeping cars will be made up for the run from that point to Detroit. The train will leave New York (foot of Cortlandt street) at 8 a. m. on Monday, July 25 and arrive at Suspension Bridge at 8.40 p. m.

The time for leaving Suspension Bridge has not been definitely fixed. It will not be earlier than 10 p. m., the intention being to allow, if possible, enough time for a short rest and a view of the falls by moonlight. It is expected that Detroit will be reached about 7 a. m. on Tuesday, July 26.

Members from Boston and the East can make connection from Sound steamers which are due in New York at 7 a. m., and the train on the Philadelphia and Reading Railroad, leaving Philadelphia at 8 a. m., will make close connection with the special at South Bethlehem.

Texas Railway Club.

The printed Proceedings of the Texas Railway Club have just been received, covering the two days' meeting held at the Menger Hotel, San Antonio, on April 18 and 19 last. Ninety-six members were present, while thirty-four applicants were elected to membership.

Mr. S. R. Tuggle, Superintendent of Motive Power and Machinery of the Houston & Texas Central RR., read a paper on "Economy in the Use of Fuel," some further mention of which is made in another part of this issue. The paper presented at a previous meeting by Mr. R. M. Galbraith, General Master Mechanic of the St. Louis Southwestern, entitled "Steel in Locomotive Construction," was discussed. Mr. George H. Bryant, of Thomas Prosser & Co., and Mr. Edward F. Goltra, of the American Steel Foundry Co., sending written discussions. A paper on "Malleable Iron in Car Construction," read at the last meeting by Mr. J. W. Addis, Superintendent of Motive Power of the Texas & Pacific, was also discussed. Mr. J. W. Hogsett, Chief Joint Car Inspector of the Fort Worth railroads, read a paper on "The System of Car Inspection." This ended the first session.

At the beginning of the second session the paper on "Heating of Car and Locomotive Journals," presented at the last meeting by Mr. J. M. Scrogin, Master Mechanic of the St. Louis Southwestern Ry., was discussed. This discussion was opened by Mr. J. A. Roosevelt, of the Galena Oil Works, who read a carefully prepared paper, which was followed by one on the same subject by Mr. James McGee, Master Car Builder of the Houston & Texas Central Ry. Mr. A. S. Grant, Master Mechanic of the Houston, East & West Texas Ry., read a paper on "The Necessity of Harmony in the Departments of Railroads." Next in order was a discussion of a paper presented at the last meeting, entitled "Economy in Car Cleaning," by Mr. J. R. Cade, Master Car Builder of the Southern Pacific Ry.

The next meeting will be held Monday, Sept. 19, at Galveston, at which time the following papers will be read: "Safety in Train Air Brake Appliances," by Mr. F. Hufsmith, Superintendent of Motive Power and Rolling Stock, International & Great Northern Ry.; "Relative Value of Good Track and Roadbed to the Economical Operation of Locomotives and Cars," by Mr. J. H. White, Superintendent St. Louis Southwestern Ry.; "Economy in the Increased Capacity of Cars," by Mr. N. L. Smitham, Master Mechanic, Texas Midland Ry. The papers presented at the April meeting will also be discussed.

PERSONAL.

—Captain Edward Shanley, a very well-known contractor, died in New York July 10.

—Mr. J. D. Temple, formerly Auditor of the Fulton County Narrow Gauge, died at Des Moines, Ia., June 24.

—Mr. Carl A. Trick, Superintendent of Bridges, Bureau of Highways, Philadelphia, Pa., died July 10, aged 57 years.

—Mr. J. E. Brazee has been appointed by the Railroad Commission of New York State Assistant Superintendent of Grade Crossings.

—Mr. David Edwards died July 5 in Detroit. He was formerly General Manager of the Flint & Pere Marquette. He was 56 years old.

—Mr. D. J. Thayer, Vice-President and Secretary of the Fulton County Narrow Gauge, died at Mercy Hospital, Burlington, Ia., Tuesday, June 21.

—Vice-President Edgar T. Welles of the Wabash Railroad has been elected President of the Consolidated Coal Co., succeeding President Ridgley.

—Mr. David McCargo, General Superintendent Allegheny Valley, who was stricken with paralysis last week, is much better, and it is now thought he will recover.

—Mr. George L. Laufer, Manager of the Pennsylvania Drop Forge Co., Pittsburgh, Pa., died suddenly on June 25, near Wilmerding, Pa., while riding a bicycle. He was 45 years old.

—Mr. John R. Latta, Auditor of the Wilmington, Columbia & Augusta Division of the Atlantic Coast Line, died June 30. He was at one time Paymaster of the Manchester & Augusta Division.

—Mr. F. B. Emery, Buffalo agent of the Empire Fast Freight Line, was elected Treasurer of the Buffalo Transportation Club, succeeding George A. Pray, who recently removed to New York.

—Mr. Andrew J. Leakin, Supervisor of Bridges, Buildings and Water Stations on the Baltimore & Ohio at Baltimore, Md., died July 2. He had been in the employ of the B. & O. since the Civil War.

—Mr. George A. Cullen has been appointed General Agent of the Western Passenger Association at New York, succeeding C. M. Pratt, who resigned to become Chairman of the new Southwestern Passenger Bureau.

—Rear Admiral Daniel Ammen, U. S. N., retired, designer of the ram Katadin, died July 11. During his career he had charge of a survey for a canal to connect the Atlantic and Pacific, and endeavored for many years to bring about the building of the Nicaraguan Canal. He was born in Ohio in 1820.

—Mr. Ichisuke Fujioka, M. E., Dr. E., Consulting Engineer of the Tokio Electric Railroad Co. and a number of other electrical enterprises in Japan, will sail for Europe on the Campania, July 16. Mr. Fujioka has been in this country for some time looking into electrical and other industries and will spend two or three months in Europe on a similar errand, when he will return to this country.

—Mr. John F. Stevens, whose resignation as Chief Engineer of the Great Northern was noted in this column June 24 (page 466), has engaged in contract work on the new line of the Canadian Pacific from the Columbia River west across the mountains toward the Pacific Coast. He has taken an interest with Mann, Foley Bros. & Larsen, who have the contract. His resignation was effective July 1.

—Mr. Almon B. Atwater, who recently was appointed Assistant General Superintendent of the Michigan Central, was born in Sheffield, O., and entered railroad service in 1864 as a telegraph operator on the Cleveland & Erie RR. He afterward entered the engineering service on the Jamestown Division of the C. & E. When the Canada Southern

was being built Mr. Atwater was appointed a resident engineer. He afterward became Assistant Engineer on the Port Dover & Lake Huron, now a part of the G. T. system, and later Chief Engineer on the Stratford & Huron, also absorbed by the Grand Trunk. He served as Superintendent of the Port Dover & Lake Huron, and later General Superintendent of the Georgian Bay & Lake Huron Division of the Grand Trunk, and as Chief Engineer of the Chicago & Grand Trunk. In June, 1885, he became Superintendent of the Grand Trunk Lines west of Detroit, including the Chicago & Grand Trunk and the Detroit, Grand Haven & Milwaukee. He has held that position up to the present. Mr. Atwater is now 53 years of age.

ELECTIONS AND APPOINTMENTS.

Atlanta, Knoxville & Northern.—The office of Superintendent N. H. Brown has been removed from Marietta, Ga., to Blue Ridge, Ga.

Baltimore & Ohio.—C. L. Cordes was appointed Traveling Freight Agent in charge of the Pittsburg Division and branches, vice R. D. Johnson, resigned. H. H. Marsh has been appointed Commercial Freight Agent, with office at Wheeling, W. Va., vice G. D. Green.

Baltimore, Chesapeake & Atlantic.—Andrew Hunter, Jr., has resigned his office of Auditor and Cashier. W. L. Rothstein has been appointed Acting Auditor and Cashier, effective June 25.

Burlington Route.—F. H. Ellis has been appointed Traveling Passenger Agent, with office at Chicago, Ill., vice Sidney Coolidge. William Fitzgerald, Jr., has been appointed Traveling Freight and Passenger Agent for the State of Texas, with office at Dallas, Tex.

Central Branch Union Pacific.—The officers of this new company, successor to the old Central Branch of the U. P., are: President, James M. Hamm, New York; Vice-President, Edward H. Ladd, Jr., New York; Treasurer, Gilmer Clapp; Secretary, F. S. Blakeslee.

Chesapeake & Ohio.—G. B. Wall, heretofore Chief Clerk to General Manager George W. Stevens, has been appointed Real Estate Agent.

Chicago & West Michigan.—H. J. Broderick has been appointed Ticket Accountant, vice J. F. Reekie, with headquarters at Grand Rapids, Mich.

Chicago, Burlington & Kansas City.—Master Mechanic F. A. Chase of St. Joseph, Mo., who has had general supervision of the Mechanical Department of the Missouri lines, was relieved as Master Mechanic of the Kansas City, St. Joseph & Council Bluffs Division. He was succeeded by C. E. Lamb, who was formerly Assistant Master Mechanic at Brookfield, Mo. Mr. Lamb's successor is W. W. Lowell, who has been assistant to Master Mechanic Chase.

Cleveland, Cincinnati, Chicago & St. Louis.—George Tozzer, who has been acting Purchasing Agent since the death of A. M. Stimson, has been appointed to that position. He was formerly Assistant Purchasing Agent. Mr. Stimson died March 8. With Mr. Tozzer's promotion the office of Assistant Purchasing Agent has been abolished.

S. E. Thomas has been appointed Traveling Passenger Agent, with office at Benton Harbor, Mich.; E. T. Laying has been appointed Commercial Agent at Pittsburgh, Pa.

Thomas O. Morris, Engineer Maintenance of Way, with headquarters at Indianapolis, Ind., has resigned, and is succeeded by Hadley Baldwin, heretofore Supervisor of Track, with headquarters at Terre Haute, Ind.

Columbus, Sandusky & Hocking.—L. W. Neereamer, Chief Clerk to Superintendent and Chief Engineer M. F. Bonzano, Columbus, O., has resigned, and is succeeded by George Walters, who was Superintendent Bonzano's Chief Clerk from 1886 to 1889, while the former was Division Superintendent on the Philadelphia & Reading.

Corvallis & Eastern.—Edwin Stone, Manager, is discharging the duties of the office of General Freight and Passenger Agent, rendered vacant by the resignation of J. C. Mayo. (May 20, page 366.)

Elkton & Middletown.—At the annual meeting held July 7 the directors elected Samuel C. Rea President to succeed Jacob Tome, deceased.

Fitchburg.—John Medway has designed the office of Superintendent of Motive Power. J. W. Marden, formerly Superintendent Car Department, will now have the title of Superintendent of Rolling Stock and will have charge of the construction, maintenance and inspection of locomotives and cars. He will report to the President. The Chief Engineer will have charge of the construction and maintenance of passenger and freight depots and all other buildings heretofore under the supervision of the Superintendent of Car Department.

Galveston, Harrisburg & San Antonio.—B. C. Cushman has been elected Treasurer, with office at Houston, Tex., vice Paul Flato.

Grand Trunk.—A. B. Atwater, Superintendent of Lines West of Detroit and the St. Clair River, has resigned and is succeeded by William Cotter, formerly Superintendent Eastern Division. Mr. Cotter's office will be at Detroit, Mich. He is succeeded by James M. Herbert as Superintendent Eastern Division, with office at Montreal, Que. R. P. Dalton is appointed Superintendent Montreal Terminals, with office at Bonaventure Station, Montreal, Que. (See Michigan Central.)

Green Bay & Western.—Henry C. Erbe has been appointed Car Accountant, vice W. J. Casey, resigned, with offices at Green Bay, Wis.

Houston & Texas.—P. A. Gorman has been appointed Assistant Superintendent of the Waco Branch.

L. E. Townsley has been appointed Commercial Agent, with office at St. Louis, Mo., vice V. B. Prim. Gentry Waldo has been appointed Traveling Freight Agent, with office at Nashville, Tenn.

Houston, East & West Texas.—T. R. Makepeace has been appointed Commercial Agent, with office at Cincinnati, O.

Knoxville, Troupsbury & Jasper.—The officers of this company, referred to in the Construction column, are: Secretary, A. Waldo Lugg, Knoxville, Pa.; Treasurer, W. W. Atwood, Addison, N. Y.; Engineer, J. T. Gear, Knoxville.

Lake Erie & Detroit River.—J. H. Coburn has been appointed Solicitor. H. Lye has been elected Secretary, with office at Walkerville, Ont., vice G. J. Leggett, resigned.

Louisville, Evansville & St. Louis.—The duties of Purchasing Agent, the office held by W. W. Wentz, who resigned to become Assistant Superintendent of the Central of New Jersey, will be hereafter discharged by General Manager George T. Jarvis. Edward D. Seltz, formerly Private Secretary to Manager Jarvis, was appointed Chief Clerk. His successor is Charles S. Thomas, formerly with the Controller of the Louisville & Nashville. J. T. Carpenter, late of the Rock Island, was appointed Superintendent of Bridges and Buildings, to succeed I. N. Munson, resigned. O. W. Putnam of the Denver & Rio Grande was appointed Chief Train Dispatcher, to succeed W. A. Carney.

Mexican Central.—T. R. Ryan, General Agent of the Mexican Central, whose headquarters are at Cincinnati, will assume the duties of General Western Freight and Passenger Agent at Chicago, succeeding M. H. King, resigned. H. J. Snyder, who is Southern Agent, with headquarters at New Orleans, will go to Cincinnati as Southern Agent. G. A. Muller, who is now Commercial Agent at El Paso, Tex., on Aug. 1 goes to St. Louis as Commercial Agent.

Michigan Central.—A. B. Atwater, heretofore Superintendent of the Western Division of the Grand Trunk, with headquarters at Detroit, has been appointed Assistant General Superintendent of the Michigan Central. (See Personal column.)

W. S. Rodger has been appointed Traveling Freight Agent, with office at Chicago, Ill., vice E. W. Howe.

Missouri, Kansas & Texas.—E. G. Rowley has been appointed Traveling Freight Agent, with headquarters at Parsons, Kan.

Missouri Pacific.—James Cullom, Master Mechanic of the M. P. shops at Nevada, Mo., who resigned, has been appointed Superintendent of Motive Power of the shops at Kansas City, Mo. James Henry will succeed him as Master Mechanic at Nevada, Mo.

Mobile & Ohio.—Louis Rauch is appointed Traveling Passenger Agent, with headquarters in St. Louis. He is assigned to the St. Louis territory and will report to F. L. Harris, General Agent, St. Louis, Mo. John Bragg is appointed City Passenger Agent, headquarters Montgomery, Ala.

New York & Ottawa.—Wade Chance has been elected Treasurer, with office at Ottawa, Ont., vice H. T. Nash.

New York Central & Hudson River.—The Law Departments of the N. Y. C. & H. R. and the West Shore have been consolidated. Ashbel Green is appointed General Counsel, with charge of all legal business of the lines east of Buffalo. Frank Loomis, who for several years has been the General Counsel of the New York Central lines, is appointed Special Counsel.

Norway Branch (G. T. System).—At the annual meeting held July 5 H. L. Home was elected President, and Cyrus S. Tucker, Freeland Howe and H. L. Home were elected Directors.

Ogdensburg & Lake Champlain.—L. E. Knuckey has been appointed Traveling Freight and Passenger Agent, with headquarters at Ogdensburg, N. Y.

Peoria, Decatur & Evansville.—B. G. Breckenridge has been appointed Traveling Freight and Passenger Agent, with office at Evansville, Ind., vice O. M. Tichenor.

Rio Grande & Pagosa Springs.—The officers of this company are: E. M. Biggs, Edith, Colo., President and Manager; C. D. McPhee, Denver, Colo., Vice-President; W. R. Dietrick, Denver, Colo., Chief Engineer; T. F. Gleason, Edith, Colo., Roadmaster. (June 3, page 399.)

Rio Grande, Sierra Madre & Pacific.—L. P. Atwood, heretofore Engineer Maintenance of Way, has been appointed Chief Engineer, succeeding J. F. Smith, with headquarters in El Paso, Tex.

St. Louis Southwestern.—J. T. Tracey has been appointed Paymaster, vice E. T. Smith.

San Francisco & San Joaquin Valley.—E. F. Henderson has been appointed Assistant Engineer Maintenance of Way, with office at Stockton, Cal.

South Atlantic & Ohio.—C. M. Ward, General Manager, has resigned, and his duties are assumed by Receiver Col. John C. Haskell. A. B. B. Harris, formerly Engineer in Charge of Track, has been appointed Acting Superintendent in charge of the maintenance of the road and the running of trains. C. L. Bunting, formerly General Freight and Passenger Agent, with headquarters at Bristol, Tenn., has been appointed Assistant to the Receiver, and has charge of all matters pertaining to the Traffic Department. Assistant Superintendent and Master Mechanic E. M. Roberts has resigned.

South Carolina & Georgia.—E. M. Averill has been appointed Foreign Freight Agent, with headquarters at St. Louis, Mo., vice Thomas G. McClellan.

Southern Pacific.—W. J. Mallor has been appointed Assistant Superintendent of Bridges, succeeding C. C. Mallard, promoted. (July 8, p. 502.)

Tallahassee Southeastern.—The officers of the Florida Construction Co., owners of this new line referred to in the Construction column, are: President, T. F. McGarry, Grand Rapids, Mich.; Vice-President, General Manager and Chief Engineer, R. L. Bennett, Tallahassee, Fla.; Secretary, Fred H. Beach, Batavia, Ill.; Treasurer, R. G. Peters, Manistee, Mich.

Union, Cove & Valley.—At a meeting of stockholders held July 2 the following officers were elected: E.

P. McDaniel, President; L. B. Rinehart, Vice-President; J. G. Stevens, Secretary and Treasurer; Joseph Johnson, Superintendent of Construction. The above officers and the following stockholders form the Board of Directors: P. J. Taylor, H. H. French and C. F. Kennedy. (July 8, p. 503.)

Union Pacific.—J. H. Lothrop, General Agent of the Freight Department at Cleveland, O., has been appointed General Agent at Portland, Ore., to succeed R. W. Baxter, who was promoted. (July 8, p. 502.)

Wagner Palace Car Co.—R. A. Forsyth, Jr., has been appointed District Superintendent, with office at Grand Rapids, Mich., vice G. G. Clay. R. A. Wilson, District Superintendent, has been transferred from St. Paul to Minneapolis, Minn. Carlton G. Crane has been appointed Pacific Coast Agent, with office at San Francisco. Mr. Forsyth was formerly a Receiving Cashier at Cleveland, O.

Wisconsin Central.—Angus Brown has been appointed Superintendent of Motive Power, succeeding James McNaughton, resigned, with headquarters at Waukesha, Wis. Mr. Brown has been Master Mechanic of the Northern Pacific at Livingston, Mont. The appointment was effective July 12. Mr. McNaughton has accepted a position as Superintendent with the Brooks Locomotive Works at Dunkirk, N. Y.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

AMHERST & EASTERN.—The proposed route is from Amherst Head, N. S., east about 20 miles via Chapman Settlement to the Gulf of St. Lawrence. Trial surveys are about beginning. (June 24, p. 467.) There will be no bridges of importance. J. A. Dickey of Amherst, N. S., is Secretary. (Official.)

ARIZONA & SOUTHEASTERN.—About 200 men and 45 teams are at work, according to report, from Deer Point, south four miles to the Mexican boundary line. A little over one mile of track is reported laid and it is thought that the entire line to Naco will be laid by Aug. 1. (May 27, p. 382.)

ATLANTIC COAST LINE.—Numerous improvements are being made along the line near Rocky Mount, N. C. Many new brick culverts are being built to replace small wooden trestles and wooden bridges.

CANADIAN PACIFIC.—This company is to build from Hartney, Man., west 20 miles (instead of east, as reported last week, page 502). Surveys are being made. It is not certain as yet whether the work will be done by the company or contracted. It will simply be prairie work with wooden structures. The rails will be old material taken from the main line. (Official.)

CENTRAL OF WEST VIRGINIA.—This company has been incorporated in West Virginia with a capital stock of \$100,000 to build a line from Morgantown, W. Va., southwest about 150 miles through the counties of Preston, Taylor, Barbour, Upshur and Braxton to the Elk River and thence to Charleston in Kanawha County. The incorporators are: Thos. E. Davis and George M. Whitescarver of Grafton, W. Va., Robert T. Devries of Wheeling, W. Va., and George C. Sturgiss of Morgantown.

CENTRAL ONTARIO.—Nothing will be done this year more than to complete the survey and locate the line on the extension from Coe Hill, Ont., north 18½ miles to Bancroft. (July 8, p. 502.) The road will not be built unless liberal donations are received from the people whose territory it will benefit. (Official.)

CHICAGO, PEORIA & ST. LOUIS.—The line from Springfield, Ill., south to St. Louis, is being stone-ballasted.

CLEARFIELD SOUTHERN.—This company was incorporated in Pennsylvania with a capital stock of \$30,000 to build a line in Clearfield County from the mouth of Little Clearfield Creek to Belsina Mills, 15 miles. A. W. Lee of Clearfield is President.

DELAWARE.—This company was incorporated in New York State July 6 with a capital stock of \$200,000 to build a line from Delhi on the New York, Ontario & Western, southeast 15 miles to Andes and Bovina Center, Delaware County. The directors are: Herbert Sewell of Walton, N. Y.; T. E. Hastings and Alexander Hilson of Bovina Center, N. Y.; James F. Copp and W. C. Oliver of Andes, N. Y.; S. P. Wilbury, Henry Honeywell, Henry Davri and G. W. Youmans of Delhi, N. Y.

DULUTH & NEW ORLEANS.—This company, as its name indicates, is to build a line from Duluth, Minn., as nearly south as possible to New Orleans, La. It is expected to begin work in Iowa, probably Mitchell County, this year. No surveying is done as yet. Robert B. Hunter of Mitchell, Ia., is among those interested. (June 17, p. 444.) The central office is at Nevada, Ia. (Official.)

ELM VALLEY.—Some preliminary surveying has been done on this line projected to run from McKinney, Tex., west about 16 miles to the county line. (Sept. 3, 1897, p. 627.) The right of way is secured, but work is suspended on account of the war. E. W. Kirkpatrick of McKinney is President. (Official.)

GUADALUPE VALLEY.—Locating surveys are in progress on the Yoakum end of this line which is projected to run from Victoria, Tex., north to Yoakum. Uriah Lott, Victoria, is President and General Manager. (Apr. 8, p. 266.)

GULF, BEAUMONT & KANSAS CITY.—This company will extend its line from Silsbee, Tex., north 17 miles, running parallel to and about six miles from the Neches River. Surveys are made and building will begin within two weeks. John H. Kirby, Vice-President and General Manager of the company, has the contract. The rolling stock will be furnished by the New York Equipment Co. Inquiries are out for the rails. (Official.)

The company will also extend its line north from Kirbyville, Tex., running parallel to the Jasper County line through Jasper, San Augustine, Center and Tenaha, crossing the Texas & Pacific at Wascom, Harrison County, and connecting with the T. & P. and the Missouri, Kansas & Texas at Jefferson, Tex. Building will begin at Kirbyville on a 25-mile section within 30 days. Contracts for the remainder are soon

to be let. The company's engineers are surveying the line in the vicinity of San Augustine on their way north. (Official.)

INDIANAPOLIS UNION.—The 235 tons of 85-lb. rails bought last February have been laid to replace wornout lighter steel on the belt line. (Feb. 25, p. 148; March 11, p. 188.)

KNOXVILLE, TROUPSBURG & JASPER.—The route of this road, which was incorporated in Pennsylvania Sept. 25 last, is from Knoxville, Pa., northwest along Troup Creek four miles to Austinburg, and thence about one mile to the New York state line, where it will meet the Jasper, Troupsburg & Knoxville, which is to extend up to the same stream to Troupsburg, and thence over the summit to Jasper, the entire line being about 16 miles. (Oct. 1, 1897, p. 696.) The route has been surveyed and the maps and profiles completed, but nothing further is done, and no present indication that the contract will be let. The work would be rather difficult and the grading heavy. The maximum grade is 126 ft. to the mile and the maximum curve 7 deg. It will require eight steel bridges, one 100 ft. long, four 75 ft., one 50 ft. and two 25 ft. The officers are given under Elections and Appointments. (Official.)

LICKING VALLEY.—This company is extending its line from Yale, Ky., south seven miles to Licking Valley. The road now runs from Salt Lake south to Yale, 12 miles, and is to be extended to Blackwater, in all 30 miles. C. H. Eaton of Yale, Ky., is General Manager.

MEXICAN ROADS.—E. Arthur Wilbur has obtained a concession from the Mexican Government to build a railroad in the state of Durango, from the City of Durango to some point on the Hacienda del Salto. Surveys must be begun within 12 months, and building within 18 months. At least 30 km. (18.6 miles) must be built within each two years, and the entire line finished within six years.

The Mexican Government has given Samuel E. Gill a concession to build a line from the mining camp Minas Nuevas southwest to the town of Parral, state of Chihuahua, and to terminate at Lagunas de Juanoto or some other point in the state of Durango not less than 50 km. (31 miles) from the starting point, with a right to extend the line to connect with the projected road from Durango to Mazatlan. The concession provides for three branches, one to Parral, another from Llanos de Cocino to the Rio Florido and the third from Llanos de Cocino to Balleza. Building must begin within 18 months from June 25, and at least 25 km. (15.5 miles) must be completed in each period of two years, and the entire line within seven years.

Lic. Ernesto Chavero has obtained a concession from the Mexican Government to build a railroad from the city of Toluca, capital of the state of Mexico, to run to Iguala, state of Guerrero, with a branch to Huatamo, passing through the mining camps of Tamascaltepec, Sultepec, Zacualpan, Taxco and Tejupic. Work must be begun within 12 months from June 16, 1898, and at least 10 km. (6.2 miles) completed each subsequent year. The entire line must be built within 10 years.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—Grading is in progress on the Kulm extension from Kulm, Lamoure Co., N. D., west to a point in the northern part of McIntosh County, where it will form a junction with the old grade of the Aberdeen, Bismarck & Northwestern, which was graded in 1887, from Aberdeen, S. D., to Bismarck, N. D., but was not ironed. This grade is now the property of the M., St. P. & S. S. M. (Mar. 18, p. 208.) The company expects this portion of the line to be completed in time to take care of this year's harvest. (Official.)

The company also intends this summer to relay with 72-lb. steel about 80 miles of the Eastern Division in Wisconsin and Michigan between Pennington, Wis., and Gladstone, Mich. (Official.)

MISSOURI & IOWA SOUTHERN.—J. E. House of Omaha, Neb., Chief Engineer, is reported to have begun work on the final survey of this line from Sedalia, Mo., north about 50 miles to Miami on the Missouri River. It is said to be the intention to build the line this year. A. L. Strang of Sedalia is Vice-President and General Manager. (Apr. 8, p. 266.)

MISSOURI RIVER, ALBION & WESTERN.—This company was incorporated in Nebraska, July 9, with a capital stock of \$100,000, to build a line from Decatur, in Burke County, near the state line, westward through Albion about 125 miles, with a branch north from Albion to the South Dakota line. The incorporators are: William Belcher, Edwin Johnson, F. H. Smith, Fitz M. Sackett and J. L. Powell.

NEW ROADS.—The Mexican Sulphur Co. has partially completed a survey for its line from the mouth of the Colorado River to San Diego, Cal.; also to Yuma, Ariz., with a branch to San Diego. (June 17, p. 445.) J. A. Dubbs, of Yuma, Ariz., is General Manager. The main office is at 1942 Forbes St., Pittsburgh, Pa., with G. H. Flinn, President. (Official.)

The Clark Drydock Co. of Detroit has accepted an ordinance from the city granting permission for a side track, about 200 ft. long, from the Wabash track into its shipyard. (Official.)

E. B. Banks, formerly City Engineer of Superior, Wis., is reported to be running a line for the Weyerhaeuser Lumber Co., from Hawthorne, Wis., on the Chicago & Northwestern, to the new town site of the company at Nebagamon, 15 miles, with a connecting line to Blackberry, on the Northern Pacific.

A new line is to be built, according to report, into the Adirondacks. It is projected to run from Clearwater, N. Y., on the Adirondack Division of the New York Central & Hudson River east to Eagle Bay, 10 miles, and thence to Racquette Lake, in all about 19 miles. Dr. Seward Webb, who built the Mohawk & Malone, and the Thomson Lumber Co. are said to be the principal projectors. W. W. Durant, who owns large lumber interests in that region, has been building a wagon road from Racquette Lake west to Eagle Bay. This road is of such monumental character that many suppose it to be for railroad purposes, and perhaps to form a part of the proposed line. There will be considerable difficulty, however, in getting the railroad through to Racquette Lake, since it must pass through land owned by the state, through which railroad building is prohibited by constitutional and statute provisions. C. N. Douglas of Albany, N. Y., is General Manager of the lumber firm of L. Thomson & Co., which has an interest in the Thomson Lumber Co. of the Adirondack region.

NEW YORK & OTTAWA.—Ballasting is in progress on the New York & Ottawa Division from Cornwall, Ont., north 50 miles to Hawthorne Junction, and it is expected that trains will begin running between Cornwall and Ottawa before the end of the month. Track-laying will begin soon on the New York side. (Jan. 21, p. 50.)

ONTARIO & RAINY RIVER.—This company proposes, according to report, to begin building Aug. 1, and engineers are in the field locating. An attempt is being made to get trackage rights over the Port Arthur, Duluth & Western, and the new line will probably begin at a point on that road 30 miles west of Port Arthur, and thence run due west to Fort Francis. The expectation is to build 40 to 50 miles this year, leaving about 200 miles for the future. (Mar. 4, p. 170.)

SALT LAKE & MERCUR.—This company is preparing an issue of \$300,000 of 5 per cent. 20-year bonds for the proposed extension down Lewiston Canyon, Utah, northwest to West Dip. The line now runs from Fairfield, Utah, to Mercur, 12 miles. (Sept. 3, 1897, p. 627.)

TALLAHASSEE SOUTHEASTERN.—The Florida Construction Co., which has bought the franchises of the T. SE., was incorporated early this year in Florida. Its purpose is to build and operate a system of railroads in the State of Florida. The T. SE., upon which work is in progress, is to run from Tallahassee, Fla., south 100 miles to the Suwannee River. Of this 30 miles is graded and some 10 miles of track laid. (July 8, p. 503.) Sixteen miles of rails are in the yards with track-laying force at work laying them. The company expects to have the first 20 miles open for business by Sept. 1 and to reach Perry, about 50 miles from Tallahassee, by January, 1899, and the Suwannee River sometime in the early spring. No contracts are let, as grading, bridging, etc., are being done by the Florida Construction Co., general contractor. The maximum grades are 0.8 per cent. and the maximum curvature 3 deg. There is an average of about 300 men at work. The officers of the Florida Construction Co. are given under Elections and Appointments. (Official.)

TORONTO & HUDSON BAY.—W. F. Jennings of Toronto, Ont., Consulting Engineer and Secretary, is reported to have gone on a trip of exploration to locate this road, which is proposed to run from the city of Toronto north through Barrie and Parry Sound to Moose Factory, on Hudson Bay. (Apr. 1, p. 246.)

UNION TERMINAL ASSOCIATION.—This company was incorporated in New Jersey July 6 with a capital stock of \$5,000,000 to acquire stock and franchises of the Kansas City & Atlantic, the Terminal Improvement Association of Kansas City and the Missouri Agricultural & Fair Grounds Association of Kansas City, Mo. It is also empowered to build railroads, canals, wharves, etc. The incorporators are: Cortlandt Parker, Jr., and Jesse R. Salmon of Newark, N. J.; William H. Lee of Greenwood, Mass.; Vernon O. Taylor of Providence, R. I.; Francis E. Dana of Summit, and Stephen Salisbury and Theodore Bates of Worcester, Mass.

WASHBURN, BAYFIELD & IRON RIVER.—The last rail is laid, according to report, on this line from Washburn, Wis., west 26 miles to the Iron River and the branch northwest to Bayfield, 13 miles. Most of the work was done last year. (Jan. 21, p. 51.)

WESTERN AMERICAN COAL CO.—The Zindorf Construction Co. of Seattle, Wash., has the contract for building this line from Carbonado, Wash., on the Northern Pacific, to the company's mines at Fairfax, seven miles. The contract requires that all clearing must be done by Sept. 1 and all the grading by Oct. 1. T. B. Corey of Seattle, Wash., is General Manager. (June 17, p. 445.)

Electric Railroad Construction.

AGAWAM, MASS.—The West Springfield & State Line Street Railway Co. has been incorporated with a capital stock of \$100,000 to build an electric railroad from Agawam to West Springfield, and among the directors are the following: E. P. Bartholomew and J. L. Worthy of West Springfield, and A. K. Fuller of Agawam.

BROOKLYN, N. Y.—The Brooklyn Heights RR. Co. began work July 7 on its new electric road from Brighton Beach to the western end of Coney Island. Two terminal stations are to be built. Several hundred feet of bulkhead is being put up to save the road from the high tide, which has at times damaged the property over which the new road will be built. The work will probably be finished in two weeks.

BUFFALO, N. Y.—The new road of the Buffalo & Lockport Railway Co. has been completed and will be open for public service about Aug. 1. The difficulties met regarding the franchises which were to be granted by the cities of North Tonawanda and Lockport have been settled.

CHICAGO.—The City Council on July 6 passed an ordinance giving the Chicago City Railway Co. leave to extend its Twenty-second street line from Indiana Ave. to South Park Ave. and 100 ft. south on the latter, the franchise to continue in force until 1903. Grooved rails must be laid and the space between tracks paved.

The Lake Street Elevated asked permission to build additional tracks with necessary spurs between Canal and West Forty-fourth streets. This request was referred to the Committee on Streets and Alleys West.

DELHI, N. Y.—The electric road from Delhi to Bloomville will probably be built in the near future. This road will form a connecting link with the steam roads at those points.

DOYLESTOWN, PA.—Surveys for the Doylestown Electric Railroad have been made and the company proposes later to make extensions to Yardley, Centerville and Morrisville.

EASTON, PA.—The Worcester Construction Co. has been awarded the contract for building the Easton, Palmer & Bethlehem Electric Railroad, the work on which has already been begun.

EAST WEYMOUTH, MASS.—The Chief Engineer of the New York, New Haven & Hartford writes us that it has been decided to extend the third rail road from East Weymouth to Braintree, and that "this

is being done as rapidly as possible. We are in hopes by the next four weeks to have it in operation."

EDWARDSVILLE, ILL.—The Mississippi Valley RR. Co. has been incorporated by John A. Meahling and others to build an electric road between St. Louis, Edwardsville and Alton.

FRAMINGHAM, MASS.—The Framingham, Southborough & Marlborough Street Railway Co. has been incorporated with S. H. Howe, F. D. Newton, C. B. Sawin, J. R. Entwistle, W. B. Ferguson, C. E. Barnes and G. A. Butman as Directors. The road will be nine miles in length, running from Worcester street, in Framingham, through Southborough and White Corner to Marlborough, where it will connect with the Worcester & Marlborough road. The capital is \$120,000.

FREDERICK, MD.—Mr. C. F. Flook, President of the Myersville & Catocin Electric Railway Co., writes us that the road will be completed Sept. 10, and that it is built to haul freight. Douglas Brothers are the contractors for the line.

HACKENSACK, N. J.—It is stated that the Bergen County Traction Co. has completed arrangements for an extension of its line from Fort Lee to Hackensack.

HARTFORD, CONN.—The power house of the Hartford Street Railway Co. will be completed by Sept. 1. A 1,350-H. P. engine made by the Pennsylvania Iron Works will be direct-connected to an 850 KW. G. E. generator. The engine will be a cross-compound condensing and a 500-H. P. Worthington condenser will be used. The new building will be 75x40 ft.

KANSAS CITY, MO.—The bids for building the Broadway Electric line were received by the Metropolitan Street Ry. Co. last week. The bids called for one and one-half miles of double track from Sixth and Delaware to Seventeenth and Madison streets. The contracts will be awarded this week.

NORFOLK, MASS.—The Norfolk Central Street Railway Co. has petitioned the Massachusetts Railroad Commissioners for permission to issue \$25,000 stock and \$60,000 bonds.

OSHKOSH, WIS.—The Oshkosh, Omro & Berlin Electric Railway Construction Co. has been organized to build an electric road from Oshkosh to Berlin, a distance of 26 miles. S. W. Hollister is president and J. K. Tillotson is Manager of the company.

The following officers and directors of the Oshkosh, Algoma & Black Wolf were chosen June 30: President, Otto U. Van Schroeder; Vice-President and Secretary, H. I. Weed; Treasurer and General Manager, E. E. Downs; Board of Directors, Otto U. Von Schroeder, H. I. Weed, M. H. Eaton, E. E. Downs and F. J. Farquhar. The general office is at Oshkosh, Wis.

PEEKSKILL, N. Y.—The Peekskill Traction Co. has been granted a franchise to build an electric road on some of the highways in the vicinity of Peekskill.

PHILADELPHIA, PA.—The Southwestern Street Railway Co. has been granted permission to lay tracks for an electric road in the 1st, 26th, 27th and 36th wards.

SAN BERNARDINO, CAL.—Plans are being made to build an electric road between San Bernardino and Redlands. It is stated that J. H. Boyd is interested in the project.

SAN FRANCISCO, CAL.—The Market Street Railway Co. has been granted three out of the seven applications for street railroad franchises. These were granted on the condition that free transportation be given over the roads to mail carriers, police officers, firemen, employees of the street department and help department when on actual duty. A franchise was also granted to the San Francisco & San Mateo Electric Railroad Co. on the same conditions at the same time.

SARATOGA, N. Y.—It is stated that the steam railroad which for years has run to the summit of Mt. McGregor has been abandoned, and that the Saratoga Electric Co. will build an electric line over the same route, a distance of about nine miles. This company has been running a line to Saratoga Lake and Geyser, which, it is stated, has been a paying investment.

SCHUYLKILL HAVEN, PA.—The Town Council has granted the franchise to the Schuylkill Haven & Orwigsburg Street Railway Co. to build an electric railroad near Schuylkill Haven to connect with the tracks of the Pottsville & Reading Electric Railway Co.

GENERAL RAILROAD NEWS.

Railroad Earnings.

Showing the gross and net earnings for the periods ending at the dates named:

May 31:	1898.	1897.	Inc. or Dec.
Chicago, Indianapolis & Louisville.			
1 month.....	Gross \$274,452	\$260,840	I. \$13,612
1 ".....	Net 80,747	91,934	D. 11,187
11 months.....	Gross 3,043,150	2,621,683	I. 421,467
11 ".....	Net 880,796	760,057	I. 120,739
Chicago, Rock Island & Pacific.			
1 month.....	Gross \$1,706,624	\$1,328,068	I. \$378,556
1 ".....	Net 534,927	354,074	I. 180,853
2 months.....	Gross 3,263,745	2,536,974	I. 726,771
2 ".....	Net 991,237	636,950	I. 354,287
Cleveland, Cincinnati, Chicago & St. Louis.			
1 month.....	Gross \$1,173,302	\$1,067,289	I. \$106,013
1 ".....	Net 257,568	245,538	I. 12,030
11 months.....	Gross 13,110,879	11,999,489	I. 1,111,390
11 ".....	Net 3,073,432	3,015,143	I. 58,289
Fitchburg.			
1 month.....	Gross \$615,928	\$608,853	I. \$7,075
Illinois Central.			
11 months.....	Gross \$25,180,236	\$20,317,483	I. \$4,862,753
11 ".....	Net 8,065,609	6,155,178	I. 1,910,431
Mexican International.*			
1 month.....	Gross \$270,505	\$240,864	I. \$29,641
1 ".....	Net 104,897	83,036	I. 20,771
5 months.....	Gross 1,294,043	1,205,937	I. 88,106
5 ".....	Net 526,493	500,907	I. 25,586
*Mexican currency.			
Minneapolis, St. Paul & Sault Ste. Marie.			
1 month.....	Gross \$336,514	\$304,234	I. \$32,280
1 ".....	Net 152,094	105,800	I. 46,294
11 months.....	Gross 3,815,241	3,285,708	I. 529,533
11 ".....	Net 1,765,466	1,515,265	I. 250,201

May 31: 1898. 1897. Inc. or Dec.

Norfolk & Western.			
1 month.....	Gross \$918,989	\$897,771	I. \$21,218
1 ".....	Net 200,586	209,332	D. \$8,746
11 months.....	Gross 10,411,351	9,685,422	I. 725,929
11 ".....	Net 3,146,953	2,432,329	I. 714,624
Oregon R. R. & Navigation Co.			
1 month.....	Gross \$580,710	\$379,172	I. \$201,538
1 ".....	Net 216,636	137,692	I. 78,944
11 months.....	Gross 6,345,555	4,272,402	I. 2,073,153
11 ".....	Net 2,754,620	1,793,084	I. 961,536
Oregon Short Line.			
1 month.....	Gross \$554,312	\$193,842	I. \$360,470
1 ".....	Net 273,855	266,119	I. 7,736
11 months.....	Gross 5,715,755	5,139,768	I. 575,987
11 ".....	Net 2,408,702	1,933,360	I. 475,342
Philadelphia, Wilmington & Baltimore.			
1 month.....	Gross \$863,558	\$801,658	I. \$61,900
1 ".....	Net 224,487	204,287	I. 20,200
7 months.....	Gross 5,243,428	4,871,728	I. 371,700
7 ".....	Net 1,157,958	1,077,558	I. 80,400
Rio Grande Western.			
1 month.....	Gross \$287,691	\$201,444	I. \$86,247
1 ".....	Net 116,696	82,094	I. 34,602
11 months.....	Gross 3,057,176	2,212,976	I. 844,200
11 ".....	Net 1,175,874	749,268	I. 426,606
Southern Pacific.			
1 month.....	Gross \$4,955,915	\$3,807,307	I. \$1,148,608
1 ".....	Net 1,890,249	1,195,929	I. 694,320
11 months.....	Gross 51,441,614	45,102,623	I. 6,338,991
11 ".....	Net 20,012,091	16,080,860	I. 3,931,231
Union Pacific.			
1 month.....	Gross \$1,364,994	\$1,242,709	I. \$122,285
1 ".....	Net 589,745	355,734	I. 233,951
5 months.....	Gross 6,285,134	5,475,901	I. 809,233
5 ".....	Net 2,513,425	1,596,898	I. 916,527
Union Pacific, Denver & Gulf.			
1 month.....	Gross \$278,712	\$294,728	D. \$16,016
1 ".....	Net 73,271	62,362	I. 10,909
5 months.....	Gross 1,533,737	1,313,607	I. 220,130
5 ".....	Net 506,128	371,409	I. 134,719

June 30: 1898. 1897. Inc. or Dec.

Chicago Great Western.			
1 month.....	Gross \$339,161	\$379,254	I. \$39,907
12 months.....	Gross 5,302,315	4,707,841	I. 594,474
Chicago, Milwaukee & St. Paul.			
1 month.....	Gross \$389,161	\$379,254	I. \$9,907
12 months.....	Gross 5,302,315	4,707,841	I. 594,474
Great Northern—			
Entire System.			
1 month.....	Gross \$1,691,253	1,480,274	I. \$210,979
12 months.....	Gross 22,562,454	19,416,453	I. 3,146,001
St. Paul, Minneapolis & Manitoba (leased lines).			
1 month.....	Gross \$1,423,657	\$1,146,546	I. \$277,111
12 months.....	Gross 18,421,835	15,630,465	I. 2,791,370
Illinois Central (Estimated).			
1 month.....	Gross \$2,065,308	\$1,793,454	I. \$271,854
St. Louis Southwestern.			
1 month.....	Gross \$329,900	\$302,600	I. \$27,300
Texas & Pacific.			
1 month.....	Gross \$437,333	\$417,855	I. \$19,478
6 months.....	Gross 3,521,181	3,050,475	I. 470,706

ALTOONA & PHILLIPSBURG CONNECTING.—The Harlan & Hollingsworth Co. of Wilmington, Del., have filed a bill in equity in the Common Pleas Court asking for a receiver for the A. & P. C. and that its mortgage right be adjudicated. The bill avers that on June 1, 1893, the railroad executed and delivered to the Union Trust Co. of New York, as Trustee, a mortgage to secure the issue of \$400,000 of bonds, of which the complainant is the holder of 10, of the par value of \$10,000 each. The bill further avers that default was made in the payment of interest on these bonds from 1894 to 1897 and that interest is still in default. The Harlan & Hollingsworth Co. on Nov. 16, 1897, requested the Union Trust Co. to commence foreclosure proceedings, but that company has declined to do so. The complainant avers that the line of railroad and its property are yet in the possession of the company, and that while defaulting on the interest, it is applying the net earnings of the road to other purposes than the payment of interest. The A. & P. C. runs from Altoona, Pa., to Lamey, 12.9 miles, with 3.8 miles of branches and spurs.

BLOOMSBURG & SULLIVAN.—The reorganization plan (May 20, p. 366) has gone into effect, and most of the security holders have received their new bonds. The line runs from Bloomsburg, Pa., to Jamison City, 30 miles, and default was made in interest July 1, 1896.

CAROLINA & CUMBERLAND GAP.—This line, which extends from Aiken, S. C., to Edgefield, 24.25 miles, has been acquired by the Southern and is placed in the Columbia Division of that road. The capital stock is \$340,000 and the funded debt \$210,000. It was reorganized Jan. 1, 1897, as successor to the Carolina, Cumberland Gap & Chicago.

CENTRAL VERMONT.—This company has filed its answer to the bills for foreclosure under the first and second mortgages by the American Loan & Trust Co. in accordance with the rule of Judge Wheeler of the United States Circuit Court. The allegations in the bills of the Trust Co. are denied. The cancellation and delivery of the \$7,000,000 bonds and mortgage of the Consolidated Railroad of Vermont to the American Loan & Trust Co., as well as its authority to make this mortgage and bonds and the authority of the Vermont & Canada to join in the mortgage, is denied, and it is claimed that the bonds and mortgage are ultra vires and void. (June 3, p. 400.)

CENTRAL WASHINGTON.—The property of this company passed into the possession of the Northern Pacific at midnight June 30. It was recently reincorporated as the Washington Central. (May 20, p. 367.)

CHICAGO & NORTHWESTERN.—This company has made an arrangement with the Union Pacific Co. whereby it acquires the right to run its own trains over the U. P. tracks from the U. P. transfer at Council Bluffs, Iowa, across the river to Omaha and South Omaha, Neb. This will result in bringing several additional trains into the Omaha station.

CHICAGO, PEORIA & ST. LOUIS.—Dent, Palmer & Co. of New York will sell at public auction on July 18, at 111 Broadway, New York, the following securities: C. P. & St. L. first mortgage 4's, \$2,100,000; preferred stock, \$1,075,000; common stock, \$297,900; Jacksonville & St. Louis income bonds, \$201,000; stock, \$100,000. This sale is preliminary to the re-

organization, which, it is understood, is to be undertaken at once. (Jan. 14, p. 35.)

CHICAGO, ROCK ISLAND & PACIFIC.—The debenture bonds under the refunding plan are called for payment Sept. 1, at 105 and interest, at the United States Trust Co. (June 10, p. 422.)

DELAWARE VALLEY, LEHIGH & HUDSON.—At a meeting of the stockholders of this company, the Delaware Valley and the East Stroudsburg & Matamoras companies, it was decided to consolidate the three. The E. S. & M. was chartered in Pennsylvania Oct. 23, 1894, to build a line through Monroe and Pike Counties from East Stroudsburg northeast to Matamoras. It was sold under foreclosure in November last to C. B. Staples, attorney for the bondholders, and it was stated at that time that the road was to pass into the hands of the D. V., H. & L. (Dec. 10, 1897, p. 879.)

The D. V. was incorporated in Pennsylvania in April, 1897, to build a road over the route of the E. S. & M., and to Port Jervis, N. Y. (Apr. 16, 1897, p. 280.)

The D. V., H. & L., which was incorporated in Pennsylvania June 24, with a capital stock of \$825,000, proposes to run from East Stroudsburg, Pa., northeast 45 miles up the Delaware Valley through Bushkill and Milford to Matamoras, and thence to Port Jervis, N. Y. Hart & McTigue of Brooklyn, N. Y., have been awarded the contract for building, which was to begin by Aug. 1. By the consolidation the three franchises, which are practically the same, become the property of the D. V., H. & L. (June 3, p. 399.)

GALVESTON, LAPORTE & HOUSTON.—This property was sold at public auction at Galveston, Tex., July 5, to George C. Holt, of Woodstock, Conn., for \$400,000. The receiver's report to June 1, issued under order of the Court, shows \$375,472 assets, which include \$215,004 cost of the road under receivership, and \$86,974 equipment. The total liabilities are \$463,466, including \$245,280 receiver's certificates issued, \$44,133 bills payable, \$109,085 audited vouchers unpaid, and \$42,805 audited pay rolls unpaid. The report also showed that there are 26 suits pending involving the recovery of 29 acres of land and damages aggregating \$179,812. Of these, 10 suits have been tried and judgments rendered, the judgments paid being \$2,103 and the judgments not satisfied \$532. (July 8, p. 504.)

KANSAS CITY, PITTSBURGH & GULF.—Attorney General M. M. Crane of Texas, on July 8, filed a suit in the District Court of Bowie County, Tex., praying for the forfeiture of the charter of this company on the ground that the offices were moved out of Texas last January contrary to the state law, which requires that general offices be in the state. The penalty asked for is \$900,000 damages besides an additional damage of \$50,000 per day following the filing of the suit.

KINDERHOOK & HUDSON.—For discussion of legal points involved in the reorganization of this road, as referred to last week (page 504), see this week's editorial columns.

MUSKINGUM, GRAND RAPIDS & INDIANA.—Coupons on first mortgage bonds (\$750,000 outstanding), due Jan. 1, 1896, are being paid by Winslow, Lanier & Co., New York. The coupons of July, 1895, were paid in October, 1897.

OHIO SOUTHERN.—The date of the foreclosure sale is Aug. 20. It will be held under the first mortgage. (July 8, p. 504.)

PEORIA, DECATUR & EVANSVILLE.—The Court has refused to allow the receivers to pay the January defaulted coupon of the Evansville division. The limit expired June 30, and under the terms of the mortgage the principal can now be declared due. It is stated that foreclosure proceedings will be pushed. (Jan. 28, p. 72.)

ST. JOSEPH & GRAND ISLAND.—This company has obtained trackage rights over the Atchison, Topeka & Santa Fe from St. Joseph, Mo., west to Plattsburg, where connection is made with the Kansas City & Northern Connecting line of the Kansas City, Pittsburgh & Gulf. The St. J. & G. I. will then run its trains south from that point to Kansas City.

ST. LOUIS SOUTHWESTERN.—This company has entered into a traffic agreement with the Gulf, Colorado & Santa Fe, whereby its company is to use the tracks of the Gulf between Wylie, Tex., and Dallas, and the trains of the Gulf are to run over the St. L. SW. tracks between Wolf City and Sherman.

SIoux CITY & NORTHERN.—The receivers have filed their report for the six months ending March 31, which shows that the gross earnings were \$1,085,826, a gain of 24.58 per cent. over the same period in 1896 and 1897. The net earnings were \$326,939, or a gain of 60.7 per cent. Since taking possession of the property in October, 1893, the receivers have paid debts under order of the Court as follows: Debts prior to receivership, \$120,909; interest on bonded debt, \$96,000; interest on interest coupons, \$19,920; court costs, \$1,000; making a total cost of \$237,829.

SOUTHERN.—F. J. Lisman & Co., New York, offer 1,000 shares Atlanta & Augusta Air Line 6 per cent. stock, guaranteed by the Southern, at 112½ and accrued interest. By the terms of the lease made with the Richmond & Danville in 1881, and guaranteed by the Southern, the dividend was to be 6 per cent. when the gross earnings exceed \$1,500,000. Dividends at this rate have been paid since 1891.

SOUTHERN PACIFIC.—Holders of Texas & New Orleans first mortgage bonds are notified that \$45,000 is applicable from the sinking fund to buy these bonds at not to exceed 10 per cent. above par at the office of the Atlantic Trust Co., New York.

TENNESSEE COAL, IRON & RAILROAD CO.—A special meeting of the stockholders has been called to meet at Tracy City, Tenn., Aug. 30, to determine whether the stockholders will approve certain contracts, deeds and conveyances with and to the Alabama Steel & Ship Building Co. of Alabama, and authorizing the Board to acquire the stock and bonds of that company.

UNION PACIFIC, CENTRAL BRANCH.—The sale of this property, which took place May 21, has been duly confirmed by the Court. The officers of the new company are given under "Elections and Appointments."

Holder of Union Trust Co. certificates of deposit, Atchison & Pike's Peak first mortgage 6 per cent. bonds and Central Branch Union Pacific funded coupon 7 per cent. bonds are notified that the Union Trust Co. is ready to make the cash payment of 20 per cent. provided for in the plan of reorganization of May 20, 1898. The new 4 per cent. bonds will be ready for delivery Aug. 1 (July 8, p. 504.)

Electric Railroad News.

BELLEVILLE, ILL.—A mortgage of \$500,000 has been filed in the Recorder's office at Belleville by the St. Louis & Belleville Electric Ry. Co. to secure a series of 40-year bonds. The money raised will be used to complete the road, work on which has been in progress for a few weeks. By contract it is to be completed Sept. 15.

BROOKLYN, N. Y.—The demand by Commissioner Shea for an increase of toll for electric cars crossing the Brooklyn Bridge from 5 to 15 cents has as yet been undecided by the street railroad companies. The demand was for a rate of 10 cents per car on 3,200 cars a day, and the same amount for all cars in excess of that number. The companies are also to pay an additional amount of \$32,000 a year as rentals. For details see issue of July 1, page 476.

BUFFALO, N. Y.—The Buffalo & Niagara Falls Electric Railway has accepted franchises from the town of North Tonawanda in which there is a condition that the road shall carry passengers at three cents each between the hours of 5 and 7 a. m. and 5 and 7 p. m. The company is also to carry passengers to Buffalo and back for 25 cents.

COLUMBUS, O.—The report of the Commissioner in the suit brought by Messrs. Green, Joyce & Co. against the Columbus Central Ry. Co. to collect assessments shows that the floating indebtedness of the latter company, including its interest, is \$278,700; the bonded debt, \$1,500,000, and the unpaid interest on bonds \$244,365, making the total indebtedness \$2,023,065. Much of the stock of this company was secured by Mr. J. J. Shipherd of Cleveland.

DULUTH, MINN.—Mr. L. Mendenhall has been appointed Receiver of the Duluth Street Ry. Co. on the application of Thomas Lowry of Minneapolis. It is stated that the road will be reorganized, due to the excessive capitalization. The present management, however, will continue for the present to direct the management of the road.

EAST ST. LOUIS, ILL.—The capital stock of the St. Louis & Belleville Electric Railway Co. has been increased from \$50,000 to \$500,000.

GREENSBURG, PA.—A syndicate of Harrisburg capitalists has purchased a controlling interest in the electric road between Greensburg and Manor. The old stockholders have been largely instrumental in the reorganization of the company. It is stated that the Greensburg & Hempfield Electric Ry. Co. may also be purchased and extended.

MONTREAL, QUE.—The Quebec, Charlevoix & Montmorency Ry. Co. has taken over the capital stock of the Quebec District Ry. Co. The bonds of the consolidated company, amounting to \$1,500,000, have been sold to Messrs. Hansen Bros. of Montreal. A remaining \$350,000 bonds are to be used for extending the present lines and substituting electricity for steam power on the Q., M. & C. Ry. Co.

NEW ORLEANS, LA.—The plan for reorganization of the New Orleans Traction Co. has been delayed, and the change in the management will be deferred for six months or more. The company paid its regular semi-annual dividend of 2½ per cent. on \$3,000,000 of bonds on July 1.

ORANGE, N. J.—The Orange & Passaic Valley Railroad Co. has secured possession of the Suburban Traction Co. of Orange, and has elected Col. C. A. Sterling President, William Scherer Vice-President, and John H. Ely Secretary and Treasurer.

OSHKOSH, WIS.—Mr. Otto U. Von Schroeder has been elected President of the Oshkosh, Algoma & Black Wolf Ry. Co. The General Manager has notified the Northwestern RR. that it desires to establish a crossing on Doty street. If the application is not granted appeal will be made to the Commissioners.

PALMER, MASS.—The Massachusetts State Railroad Commissioners have approved an issue of \$35,000 stock by the Palmer & Monson Electric road. This will make the total \$60,000.

REDLANDS, CAL.—A meeting of the Directors of the Lytle Creek Light & Power Co. was held on June 24, at which time an assessment of 50 cents per share was levied on the stockholders. Any stock left unpaid by July 29 will be advertised for sale at public auction and will be sold on Sept. 3.

ST. LOUIS, MO.—A mortgage for \$150,000, given by the St. Louis & O'Fallon RR. Co. to the St. Louis Trust Co., was filed on July 2. The mortgage was to secure a bond issue for that amount.

SAN FRANCISCO, CAL.—The assessment roll shows that the Market Street Railway Co. is assessed for \$6,397,100 on personal property and \$1,178,300 on real estate, making a total valuation of \$7,575,400.

SIDNEY, N. Y.—Local reports state that the Sidney & Franklin Electric Railroad has been purchased by Robert Cartwright of Sidney, at receiver's sale.

WELLESLEY, MASS.—The Wellesley & Boston Street Railway Co. has petitioned the Railroad Commissioners of Massachusetts for the right to issue \$25,000 additional stock.

WESTCHESTER, PA.—A meeting of the stockholders of the Philadelphia & Westchester Traction Co. is to be held Aug. 23 to authorize a mortgage indebtedness of \$340,000 with which to build an extension along the Westchester turnpike 10 miles in length.

WHITE PLAINS, N. Y.—The White Plains & Mamaroneck Electric Ry. Co. has completed its electric road from White Plains to Mamaroneck, which, with its line to Tarrytown, connects the Hudson River with Long Island Sound, and the railroad company proposes to carry freight between points on the river and Sound.

TRAFFIC.

Traffic Notes.

The Attorney General of Texas has filed five suits in court against the St. Louis & Southwestern for giving secret rebates on freight bills.

The Delaware, Lackawanna & Western has made a large reduction in the selling price of anthracite coal at Chicago, stove size being offered at \$4 a ton.

The Pittsburgh, Bessemer & Lake Erie lately took 1,400 tons of coke from the Youghiogheny Valley, Pennsylvania, to Conneaut, O., whence it was sent by steamer to Chicago.

The total amount of freight carried through the two canals at Sault Ste. Marie during the month of June was 2,949,465 tons; east bound, 2,317,181; west bound, 632,284. The east bound total includes 1,897,953 tons of iron ore.

The Wabash recently discovered a lot of forged tickets in brokers' hands in Chicago, purporting to be regular Wabash round-trip tickets from Chicago to St. Louis and return. About the same time some counterfeiters over the same road were bought (and sold) by brokers in Kansas City. It is believed that all of these tickets were printed in Chicago.

The Canadian Department of Railways and Canals, which has been asked to keep the St. Lawrence canals open on Sunday, has decided that the time during which they are kept closed shall be reduced to 15 hours; that is, from 6 a. m. to 9 p. m. A protest was entered against granting the request to have the locks operated at all hours on Sunday.

The Central Freight Association has issued a notice that shipments to British North America are to be treated as domestic, this being for the purpose of using a revenue stamp for one cent, instead of one for 10 cents, on bills of lading. Whether this means an attempt at evasion of the law or that bills of lading will be issued only to the frontier is not apparent.

The destruction of the Spanish navy has been followed by a general resumption of vessel traffic between New York and ports on the Gulf of Mexico. The Benner Line (sailing vessels which run between New York and Galveston) announces a tariff of freight rates ranging from 28 cents, first class, to 17 cents in the lowest class. From a large territory adjacent to the Atlantic Seaboard this line will absorb railroad rates up to 6 cents per 100 lbs. (first class).

Freight rates on the lines of the Joint Traffic Association seem to continue in a demoralized state, though not much information about them is published. A reporter of the New York Journal of Commerce, after careful inquiry, finds that in westbound freight the situation is now "satisfactory," which on further investigation appears to be understood as meaning that the weaker lines which have been making secret reductions of 50 per cent. are now cutting the rates only 30 per cent.

Passenger rates between Chicago and St. Paul and also between Chicago and the Missouri River are considerably demoralized, but it is difficult to keep track of the frequent changes. Within the past week the Rock Island has given notice of a reduction of \$2 or \$3 to St. Paul, and three or four roads have announced a reduction of \$2 to Kansas City. In the meantime meetings are appointed to see if restoration can be effected, and a considerable share of the current business seems to be done through brokers' offices.

The Massachusetts Railroad Commissioners have been dealing with the bicycle baggage question again, the League of American Wheelmen, through Sterling Elliott, having importuned them for a change in the tariff of 1896, which was fixed at 10 cents where the fare was 75 cents or less, with a graduated increase for longer distances. The petitioners asked that the rate be 10 cents to all points and no more. The board rendered a decision on Monday of this week to the effect that the tariff of 1896 is working well and should not be disturbed.

The Merchants' Association of New York, which has secured reduced fares for retailers coming to the city from practically all points east of the Mississippi River, applied to the Western roads for reduced rates from points as far West as the Missouri, but, being refused, has sent a circular to merchants in the West advising them to come to New York on excursion tickets, which are being sold to Buffalo for the meeting of the Baptist Young People's Union. Detailed instructions are given in the circular as to getting the time limit of the return portion of the ticket extended at Buffalo.

The Interstate Commerce Commission has reaffirmed its decision of March 13, 1897, concerning the rates on milk to New York City, so far as it concerns shipments from points on the Ulster & Delaware Railroad. In that decision, which established group rates and divided the territory into four groups, the road named was allowed to charge higher than the other milk-carrying roads from the fourth or most distant group, because its road was very hilly and because it had no traffic at all from the territory nearer New York. B. Brockway and others complained at this, but the Commission sticks to its original decision.

The Assistant Secretary of the Treasury has made a ruling to the effect that imported goods transported in bond, unappraised, from the seaboard to interior ports, may be sent to two or more cities in the same car. Heretofore the rule of the Treasury Department has been that cars must be sealed by an agent of the Customs Department at the place where the goods are loaded, and not opened except at destination. This necessitated sending many partial carloads or the detention of goods until other freight could be gathered for the same destination to make enough to justify sending a car. Under the new rule the customs officer at the intermediate port may open a car and subsequently reseat it, keeping a record of the seal.

Galveston Exports.

During the season 1897-8 there has been exported from Galveston, Tex., 1,446,284 bales cotton, an increase of 21½ per cent. over previous seasons; 14,011,074 bushels grain, an increase of 52 per cent.; 212,596 tons cottonseed cake and meal, an increase of 58½ per cent. During the season 349 steamers loaded, with a net register of 645,048 tons, an increase of 35½ per cent. in net register over the previous season. There is now a depth of 27 feet of water over the bar, which it is expected will be increased to 30 ft. another season.

Decision on Cotton Rates from Texas to New Orleans.

The Interstate Commerce Commission, in an opinion by Commissioner Prouty, has decided the case of the Dallas Freight Bureau against the Texas & Pacific and other roads, in which complaint was made of excessive freight rates on cotton to New Orleans. The same rate applies from practically all cotton shipping points in Texas. It is made by adding 10 cents to the rate in force to Galveston, which is fixed by the State Railroad Commissioners of Texas. Since this proceeding was begun the Texas Commissioners have reduced the Galveston rate from 65 cents to 60. The differential is conceded to be reasonable. About 65 per cent. of Texas cotton goes to Galveston and 25 per cent. to New Orleans. The Commission holds that the New Orleans rate may not be altogether reasonable, but that the evidence does not warrant an interference with the present adjustment. In the same proceeding the Commission justifies higher rates from New Orleans to Dallas than to Kansas City, water competition existing at the same place.

The New Western Freight Agreement.

The main provisions of the new agreement of the Western Trunk Line Committee, which went into effect July 15, are as follows:

The organization is to consist of the Freight Traffic Manager or general Freight Agent of each road, to be known as "the Committee. In addition to the Committee there is a Board of Four Commissioners, one of whom is Chairman and another Vice-Chairman of the Committee. All proposed changes in rates, rules or regulations are to be submitted to the Board of Commissioners to be docketed for consideration at the next meeting of the committee. In cases where a proposed change of rate fails to receive the unanimous approval of the committee it may be submitted to the Board, and if the decision of the Board is adverse the executive officer of the line desiring to make the change must give the Chairman 10 days' notice of intention to adopt the rate. The Board is required to investigate all complaints of violation of the agreement, and may also act on its own motion "upon knowledge or reasonable suspicion." The penalty provided for each violation is to be a fine of not less than \$100 nor more than \$500, to be assessed by the Board. Each member is obliged to keep on deposit at all times \$500 to the credit of this fund. Each member is to have the support of the committee in meeting outside competition of water or rail lines not members of the committees. The agreement is effective until June 30, 1899, and thereafter subject to 30 days' notice of withdrawal by any member.

Chicago Live Stock Receipts for the Half Year.

Receipts of live stock, car loads, at Chicago for six months to July 1 were:

	1898.	1897.	1896.	1895.
A., T. & S. Fe.....	3,584	4,487	5,278	5,825
C. & Alton.....	5,540	6,867	8,788	8,515
C., B. & Q.....	31,521	32,555	33,792	28,843
C. & E. Ill.....	2,964	2,287	2,227	3,021
C., M. & St. P.....	24,136	22,083	21,341	18,371
C. & N. W.....	30,568	27,167	26,950	22,653
C., R. I. & P.....	12,068	12,065	12,902	13,151
C. & G. Western.....	3,870	4,598	4,579	3,571
Ill. Central.....	12,829	11,982	12,238	12,592
Wabash.....	4,283	4,792	5,725	7,672
Wis. Central.....	787	1,257	1,908	720
Other roads.....	3,796	3,136	2,839	2,825
Total cars.....	136,027	133,256	138,667	128,289

Chicago Grain Receipts for the Half Year.

Receipts of grain at Chicago for six months to July 1 aggregated 43,070 cars more than during the same time last year, as follows (car loads):

	1898.	1897.	1896.	1895.
A., T. & S. Fe.....	4,081	5,258	3,107	3,389
C., B. & Q.....	24,973	16,707	18,198	11,574
C., R. I. & P.....	19,436	10,584	12,624	5,892
Chicago and Alton.....	7,222	6,573	6,650	7,066
C. & N. W.....	15,404	14,914	14,655	9,449
C., R. I. & P.....	3,717	4,386	2,307	5,304
C. & E. I.....	18,861	13,649	12,968	4,680
C., M. & St. P.....	4,986	3,160	5,387	1,277
Chic. Gr. West.....	19,410	14,167	15,617	12,917
Illinois Central.....	19,410	14,167	15,617	12,917
Wabash.....	4,064	2,910	4,789	7,263
Wis. Central.....	235	186	125	147
E. J. & E.....	9,662	4,717	1,558
Other roads.....	10,332	2,430	9,815	8,381
Total cars.....	142,733	99,663	107,801	77,339

The Burlington brought in 17.5 per cent. of the total amount. The Illinois Central and the Rock Island each carried 13.6 per cent.

Southwestern Passenger Bureau.

The reorganized Southwestern Passenger Bureau is now reported to be in working order. The membership includes the Atchison, the Rock Island, the Fort Worth & Denver City, the Houston & Shreveport, the Missouri, Kansas & Texas, the Missouri Pacific, the Iron Mountain, the Texas & Pacific, the Kansas City, Pittsburgh & Gulf, the St. Louis & San Francisco, the St. Louis Southwestern and the Southern Pacific. There is a Chairman, an Executive Board and a Conference Committee. The Executive Board consists of the President, or other executive or managing officer of each of the lines. The Conference Committee consists of the Chairman and the Chairman and Conference Committee of the Southwestern Bureau (the Freight Association). The latter committee is to pass upon the guilt or innocence of accused members, after hearing the evidence and, in case of conviction of wrong doing, to inflict the penalties provided by the agreement.

The more important provisions of the agreement are: All proposed changes in rates not agreed to in open meeting may be made effective on three days' notice to the Bureau if notice is given within five days.

The chairman shall investigate all complaints of illegal reductions in rates and may act upon his own motion upon reasonable supposition and make report to the Conference Committee. Charges of violation may be preferred by one member against another for investigation by the committee. The committee may assess a penalty not to exceed \$100 for each violation of the agreement or the general rules of the association and each member is required to keep on deposit to the credit of the association not less than \$500, applicable to fines, the fines to be used toward defraying the expenses of the Bureau. The chairman is given power to suspend joint relations with any line outside the Bureau whose tickets conflict with the rates or rules of the Bureau.

The agreement became effective June 15, to continue in force until Sept. 30, 1898, and thereafter subject to 30 days' notice of withdrawal of any member. C. M. Pratt is Chairman of the Bureau, with headquarters at St. Louis.